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"Happy, truly, is the naturalist. He has no time for melancholy dreams. The earth becomes to him transparent; everywhere he sees significancies, harmonies, laws, chains of cause and effect endlessly interlinked, which draw him out of the narrow sphere of self-interest and self-pleasing, into a pure and wholesome region of solemn joy and wonder."—CHARLES KINGSLEY in '*Glaucus*.'

"The perfect naturalist should have in him the very essence of true chivalry, self-devotion; the desire to advance not himself and his own fame or wealth, but knowledge and mankind. . . . . The spirit which gives freely, because it knows that it has received freely; which communicates knowledge without hope of reward, without jealousy and mean rivalry, to fellow-students and to the world."—CHARLES KINGSLEY.

"And this our life, exempt from public haunt,
Finds tongues in trees, books in the running brooks,
Sermons in stones, and good in everything."
'*As You Like It*,' Act ii., Scene 1.

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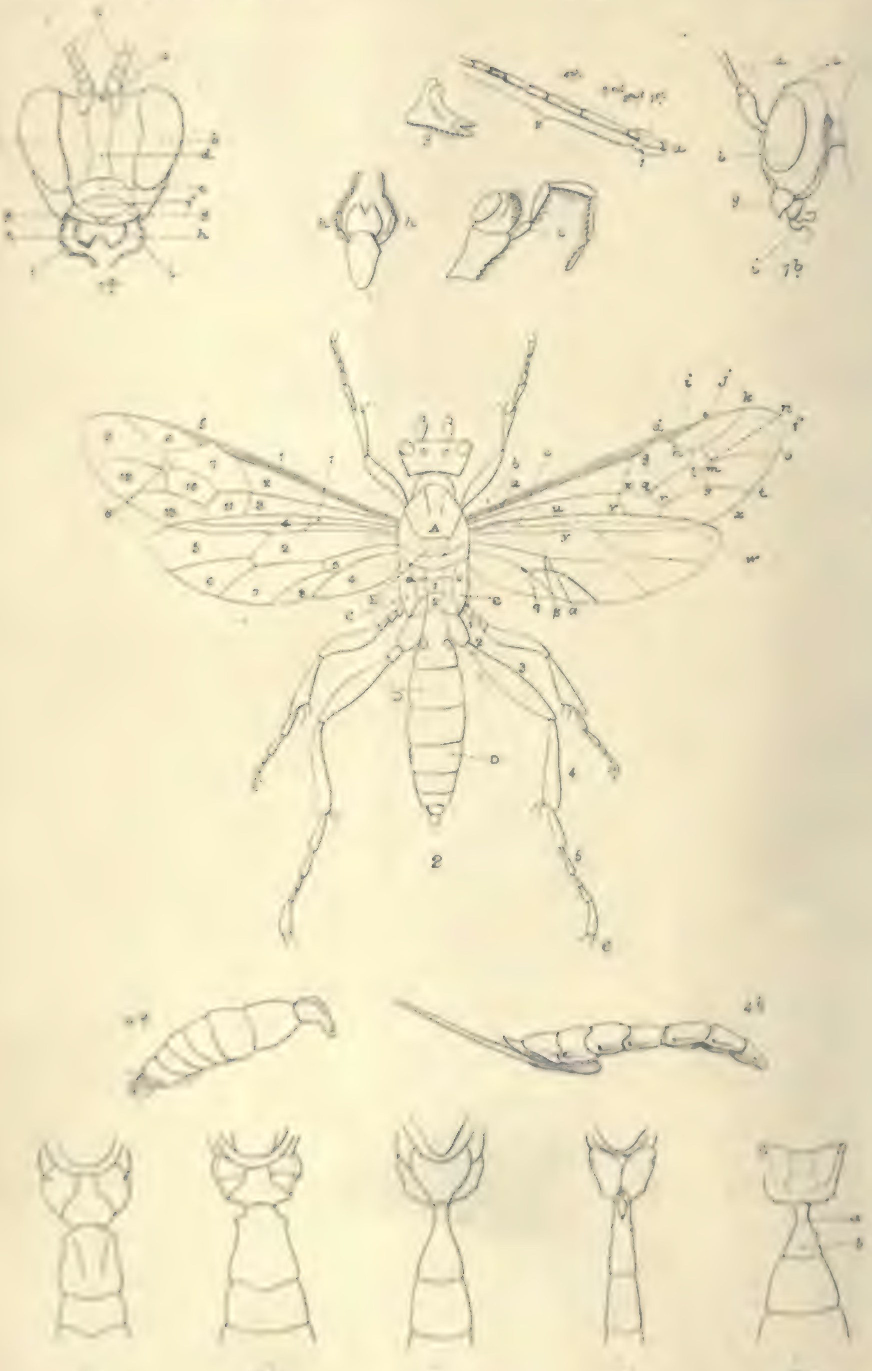
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NOTES ON THE RHOPALOCERA OF NATAL.

By A. J. Spiller.

Natal, the "Garden of South Africa," is far more abundantly supplied with butterflies than any other part of British South Africa. Many species, such as *Junonia Natalica*, *Salamis Anacardii*, *Acræa Petræa*, *Eronia Leda*, *Papilio Policenes*, &c., are found in abundance along the coast district, and occur nowhere else south of the tropic of Capricorn. The climate in the lowlands adjoining the sea is quite tropical, and butterflies are to be found every fine day throughout the year; in fact, even in the depth of our "winter" more species are to be obtained than in the middle of summer at home. Trimen, in his work on the Rhopalocera of South Africa, enumerates 222 species as inhabitants of the country south of the tropic of Capricorn; but the list is evidently incomplete, since I have taken several new species myself.* In Natal I believe at least 200 kinds occur, many of them very beautiful, although, of course, their splendour cannot equal the beauty of the magnificent denizens of the Amazon.

The best months for butterflies are March and April, and then the country is all alive with insect beauty. Several species remind one forcibly of England. Thus *Papilio Demoleus* bears a superficial resemblance to *P. Machaon; Pieris Agathina* to *Pieris brassicæ; P. Pigea* to *P. rapæ; P. Hellica* to *P. Daplidice* and the American *P. Protodice; Colias electra* to *C. edusa.* Several of the *Acræas*, on the wing, closely resemble the smaller Fritillaries, such as *Argynnis Euphrosyne* and *Melitæa Artemis;* and amongst the Skippers, *Pyrgus Vindex*, *Pamphila Pontieri*, and *P. Havei*, correspond respectively to *P. Alveolus*, *Hesperia Comma*, and *H. Linea.* Three European species occur plentifully, viz., *Danaus Chrysippus*, *Lycanæa Bœtica*, and *Pyrameis Cardui.*

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* A great number of additional species have been recorded by Trimen and others since the publication of his work.—Ed.

Twelve species of the genus *Papilio* occur. *Merope*, a straw-coloured species banded with black, occurs sparingly, and seems to be commoner in Cape Colony than here. It is a "bush" butterfly; all the specimens I have met with have been taken in the deep recesses of the forests. The splendid green and black *P. Policenes* is abundant around the bay of Port Natal. It flies with great rapidity, but is easily captured when settled on damp ground. On New Year's Day, 1879, I took a very fine series in this manner in woods at Umgeni, about four miles from Durban. It had rained heavily during the night, and going next morning to their haunts I was rewarded by taking several dozens of this species, as they drank the moisture from the damp ground. Another black and green swallow-tail is *P. Nireus*, which is common everywhere; its abundance, however, is surpassed by *P. Demoleus*, which is as plentiful as *Pieris rapæ* at home. A species called *Pap. Pylades*, but which is rather different from the normal type, is very plentiful at Durban and *Leonidas*, is also abundant; but my greatest prizes amongst this family have been *P. Zenobius* and *P. Cenea*, the former a large black and white insect, and the latter a fine black butterfly, with yellow-ochreous spots. This latter species is most plentiful in April, and delights to sun itself on the dark green leaves of the orange tree. The largest swallow-tail, *P. Ophidocephalus*, was first taken in Kaffraria by Mr. Bowker, an enthusiastic entomologist of Natal. This species expands about five or six inches, and is not unlike an exaggerated gigantic *P. Machaon*. It occurs at the Inanda, about eleven miles from here, and appears in the beginning of the year; but I have not been successful yet in taking it, for exactly at the time I planned an expedition there, the dreadful disaster of Isandhlwana occurred, the effect of which was to send all the country residents flocking to the towns for protection from threatened Zulu raids When confidence had in some measure been restored, and the residents at the Inanda returned to their farms, I rode to the locality, and remained there several days seeking it, but, unfortunately, without success. However, I was successful in capturing a fine new species of the genus *Debis*, a new *Nymphalis*, and saw a new species of the genus *Atella*, which in my eagerness I failed to catch.

The "whites" are not well represented here. *Pieris Agathina*, *P. Pigea*, *P. Severina*, and *P. Gidica* are all abundant, but *P. Mesentina*, *P. Calypso*, and *P. Hellica*, I take but sparingly.

One of the most interesting genera of South African butterflies is the genus *Anthocharis*. Eighteen species are recorded by Trimen, but it is, I think, fairly questionable whether some of these are not merely summer and winter forms of the same species. Thus *A. Evarne* and *Keiskamma* are generally given as two distinct species;* but, after a most careful investigation of these so-called species, I am convinced they are simply summer and winter forms of the same. In summer they are all *Evarne*, in winter all *Keiskamma;* the same bushes that produce *Evarne* in summer, harbour *Keiskamma* in winter. *Evarne* is darker on the upper surface and lighter beneath than *Keiskamma*. Their ground colour is sulphur-yellow, with orange apical blotches. Many of the South African *Anthocharis* have brilliant orange-red apical blotches, and are marked in summer with deep black bars. Now in winter the same species occur, but they have, in ninety-nine cases out of a hundred, lost their black bars, and are plain white, with orange-red blotches at the apices of the wings. A very handsome purple-tipped species is *A. Ione;* it is plentiful near Durban, and occurs, I am told, far up in the Transvaal.

Four species of the genus *Eronia* are found in Natal; two of them, *E. Leda* and *E. Cleodora*, are abundant; the others are scarce; *E. Leda* is a large sulphur-coloured butterfly, with orange tips; *E. Cleodora* is yellowish white, with black margins to all the wings. These are swift flyers, but *E. Leda* is not a difficult butterfly to catch; its large size and brilliant colours render it a sure mark directly it comes within the sweep of the net. Both species are particularly fond of river-courses, especially when these are nearly dry, and their sides covered with sloping brushwood.

The genus *Callidryas*, as entomologists well know, is essentially a tropical one; hence only two species occur in Natal, and these are found in the middle of summer. The white *C. Florella*, whose range extends from Kaffraria to Egypt, is the commoner; it is fond of settling on flowers at the edge of forest lands. The yellow *C. Rhadia* I have seen but twice, and then the amazing rapidity of its flight rendered pursuit hopeless.

Colias Electra is a very plentiful insect; it is almost identical with *C. Edusa*, and like it, has a white variety of the female. At Cape Town, on Nov. 29th, 1878, I found this the commonest butterfly; it occurred by hundreds on Table Mountain and the

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* Mr. Kirby, in his catalogue of the Diurni, places both these as one species.—Ed.

Lion's Head; a species of *Erebia* (*E. Hyperbius*) and *Leptoneura Cassus* also flew there.

I have taken four of the genus *Terias* in the colony, they all seem tolerably numerous near here. The species are *T. Rahel*, var. *Desjardinsii*, *Brigitta*, and *Pulchella*.

Three species of the genus *Danaus* inhabit the colony; the most abundant being *D. Chrysippus*, which is to be seen all the year, and to be met with in all kinds of localities, gardens, fields, hillsides, and forests. Some of the *Acræas* mimic this species, and so perfect is the resemblance on the wing that many female *Acræas* look exactly like very small specimens of *D. Chrysippus*. The female of *Diadema Misippus*, however, is the most perfect mimic of the species in question that I have ever seen. It is exactly the same size, the ground colour in most instances the same, in others slightly lighter, and it possesses the white spots near the apices of the fore-wings, as in *D. Chrysippus*. A very rare variety of *D. Chrysippus* is occasionally found without the customary white apical spots (var. *Dorippus*), and to make the mimicry perfect there is a similar variety of the female *D. Misippus*. The male of *D. Misippus* is utterly different, being a rich black, with, in good specimens, a suffusion of purple, and with a purplish violet spot in each wing. Specimens of *D. Chrysippus* are met with in the middle of summer that possess partially white hind wings; in one instance I met with a specimen identical with the West African form, *Alcippus*. Another *Danaus*, *D. Echeria*, is very plentiful in woods, and flies with a very graceful flight, very much like *Limenitis Sibylla* at home. The third species, *D. Ochlea* (a black and white species), is tolerably plentiful, but in my cabinets I find it represented by about twenty specimens, all that I have managed to secure in this part of the colony.

The *Acræas* are a peculiar African family of butterflies; they have long and narrow fore wings, and most of their females mimic *Danaus Chrysippus*. *A. Horta*, though plentiful at Cape Town, is not abundant on the Natal coast; but in the elevated lands, twenty miles inland, I have taken it. It has a more lofty flight than the others of this family. *A. Dice* (*Querina*) I have taken twice; it seems very rare. *A. Zetes* is also a scarce insect, and the same remark applies to *A. Aganice*, which latter insect is the largest of the family. *A. Violarum* is plentiful at Durban and along the coast to the Tugela; it is of a brick-red colour, suffused with orange. *A. Nohara* is a rather local species; its colour is fulvous-yellow, and it is a rapid flyer. *A. Hypatia* (*Natalica*) is tolerably plentiful, and the beautiful *A. Petræa* is very plentiful. It is of a brick-red colour, spotted with black in the male, whilst in the female I possess every possible variety betwixt brick-red and absolute black. *A. Rahira* is abundant at Durban on land that is now being built upon. *A. Lycia* is common in grassy places; *A. Serena*, *Cynthia* (*Eponina*), and *Protea* (*Esebria*) are also common; whilst the two most singular members of the family are, in my estimation, *Acræas Punctatissima* and *Alæna Amazoula*. The former is a rather rare species, its expanse of wing an inch and a half, its colour ochreous-yellow, spotted like a leopard; on the four wings I count 114 spots. The singularity of this butterfly has induced me to scour the country for miles round Verulam for it, but after eight months' collecting I only observe fifteen specimens in my collection. *A. Amazoula* has generally been considered a great rarity; it is, I find, very local, haunting broken ground and settling on the tall grass. The evening is the best time for its capture, as the butterflies may then be easily taken as they rest (*in cop.*) on the grass-stems. Its habits during sunshine resemble the *Hesperidæ* rather than the *Acræinæ*, and a "beginner" would naturally place it amongst the Skippers. I only know two localities for it; in each case the insect is restricted to a small patch of ground, although the surrounding country seems equally suitable and similar, but in these localities it is so plentiful that I find I have taken 200 fine specimens, and there is not the least apparent diminution in their number.

The Asiatic and African *Atella Phalanta* is pretty common everywhere; on the wing it exactly resembles a Fritillary. *Pyrameis Cardui* is plentiful, of course; colonists here name it the "Sand-butterfly." Another species, probably *Hypanartia Hippomene*, resembles a small *P. Atalanta* with tails; it is scarce; the only specimen I ever saw was resting on a hut in a Kaffir location.

(To be continued.)

INTRODUCTORY PAPERS ON LEPIDOPTERA.

By W. F. Kirby.

No. XV. NYMPHALIDÆ—NYMPHALINÆ.

(CYRESTIS to VICTORINA.)

The genus *Cyrestis* includes a number of delicate species confined to Tropical Asia and Africa. The smallest species expand rather under one inch and a half, but the majority expand from two to two and a half inches. The shape of the hind wings is peculiar, as they are generally produced into a lobe at the anal angle, and there is a short projection or tail at the lower part of the hind margin, where the wing is angulated. Many of the species are white, frequently more or less bordered with brown. The border is generally marked with tawny at the anal angles, and sometimes with a more or less distinct row of black spots in pale rings. Towards the base the white species are marked with very delicate transverse lines, or with double black lines, filled up with brown, or (in the African species) with pale yellow. Another group of the genus is tawny, with single or double transverse brown lines (in the latter case filled up with the ground colour); and a third group is dark brown, with paler transverse lines towards the base, a submarginal row of eyes, and a tawny spot at the anal angle of the hind wings. Across the centre of the wings is a transverse band of white, varying in width.

This genus is represented in South America by the genus *Megalura*. These are more robust insects, and might be mistaken for *Papilios* but for their undeveloped front legs, as there is a long tail at the lower part of the hind margin of the hind wings, and a lobe at the anal angle, which in some species is also greatly produced. Most of the species are of some shade of dark brown, or tawny, with slender dark lines running from the costa across both wings: some, however, are tawny, with broad dark margins, and the basal half of the hind wings blue. One species, *M. Harmonia*, Klug, is yellowish white, with slender lines. *M. Peleus* and *Eleucha* are long-winged tawny species, with transverse black lines, and have three tails on the hind wings, that in the centre being the longest. The typical group expand about two inches and a half; the long-winged species are larger.

The genus *Victorina* likewise consists entirely of South American species. They are rather large insects, with dentated hind wings, the middle tooth projecting into a short tail. One of the commonest species is *V. Steneles* (three or four inches in expanse), which has a superficial resemblance to *Colænis Dido*, being brown, with a broad greenish central band on the hind wings, which is broken into large spots in the fore wings, and there is an outer row of green spots, preceded by a red spot or orange spot placed at the anal angle of the hind wings. A smaller species, *V. Sulpitia* (about two inches in expanse), is brown, with a common greenish white band divided on the fore wings, beyond which, on the hind wings, is a more or less distinct tawny stripe. The upper side resembles that of *Pyrrhogyra*, but the under side is more like that of some species of *Adelpha*, being transversely banded with dull white, black and tawny. *V. Epaphus* is a larger insect (three inches in expanse), brown, with a white stripe running from the middle of the costa of the fore wings to the root of the tail. The outer portion of the fore wings is tawny. *V. Trayja* closely resembles this, but the outer part of the fore wings is brown. The Mexican and Central American *V. Superba* may be known by the white band being bluish on the edges; the fore wings beyond it are brown, with a slight tawny shade, and their hind margin is more emarginate than in any other species of the genus.

[The next paper will be devoted to *Hypolimnas* and other Old World genera. I regret that in consequence of my transfer from the Dublin Museum to the British Museum I was obliged to discontinue my papers in the 'Entomologist' for a time. I hope now to be able to continue them at intervals, though perhaps not quite regularly at present.—W. F. K.]

THE TORTRICES OF SURREY, KENT, AND SUSSEX.

By Walter P. Weston.

(Continued from vol. xii., p. 220.)

Ptycholoma Lecheana, Linn.—Common everywhere among oaks (*Quercus robur*) and elms (*Ulmus campestris*), in the rolled-up leaves of which the larva feeds; the imago flies very freely and boldly towards dusk, when it is often rather a pest than otherwise.

Ditula Hartmanniana, Linn.—A local species, but not uncommon where it occurs. The imago is to be found at rest on the trunks of willow trees, but it is not easy to box, as it runs quickly up the stem, keeping in the crevices of the bark, and when clear of the box flies to the topmost branches. In Kent it has occurred at Lewisham, New Cross, and near Gravesend; while the Surrey localities are Surbiton, Weybridge, and near Hammersmith. It may be expected to be met with all down the Valley of the Thames, wherever willows occur..

D. semifasciana, Haw.—Widely distributed among sallows, but not abundant. The larvæ feed in united shoots of sallow in May and June, generally preferring dwarf and stunted bushes, and the imago appears in July. It does not fly freely till nearly dark, when it can be easily taken by the aid of a lantern, flying from shoot to shoot, or at rest on the leaves. It also comes to sugar.

Penthina corticana, Hub., *picana*, Fro.—Widely distributed. The larvæ may be found in May and the early part of June, feeding on birch (*Betula alba*) and on some of the sallows. The imago appears in June and July, and should be looked for at dusk, flying round the trees, or it may readily be disturbed by beating. It may be distinguished from the following species by its having large patches of white in the basal portion of the fore wings, which sometimes are united and occupy the whole of the basal portion of the wings, separated by a broad, irregular band of black from the white apical patch. This extreme form is, however, of great rarity.

P. betulætana, Haw.—Much commoner than the preceding species, which it much resembles in general appearance.

L. capræana, Hub.—Local, but distributed. This species may be reared from collected shoots of sallow in May and June, which should be kept in a flower-pot, in a cool and airy place. The imago appears in July, and may be obtained by netting at dusk, and also by beating. It is more common among sallows in hedgerows, and this season (1879) was unusually abundant. It is recorded from West Wickham and Croydon in Surrey; Haslemere, Tilgate, Lewes, and Hastings, in Sussex; and in Kent at Darenth, Strood, and Tunbridge Wells.

P. sororculana, Zett,=*prælongana*, Gn.—Distributed throughout, but not common in the South of England. I have found this species scarcer in these counties than the preceding one. The larva is said to feed in the autumn on birch; the imago is certainly to be taken in May, amongst birch trees.

P. pruniana, Hub.—Common everywhere, and most abundant by whitethorn hedges.

P. ochroleucana, Hub.—Widely distributed, and not uncommon among roses, especially the cultivated sorts, in gardens. It is best when bred. The larva feeds in May, and the moth appears the following month.

P. cynosbana, Linn.—Abundant everywhere.

P. dimidiana, Treit. Sod.,=*ochromelana*, Gn.—Local. The Rev. E. N. Bloomfield records its occurrence sparingly at Hastings.

P. sauciana, Hub.—Local. In Kent, it occurs near Sevenoaks and Tunbridge Wells; in Surrey, at Leith Hill; and at Haslemere, in Sussex.

P. gentianana, Curt.—Common throughout among teasel (*Dipsacus sylvestris*), in the seed-heads of which the larva feeds. These heads should be gathered in March or April, and put into bandboxes. The moths will emerge in July or August without further trouble.

P. sellana, Hub.—Distributed, but not abundant. The imago frequents grassy places with mixed herbage, broken ground, &c., and is particularly partial to railway slopes. It is an insignificant insect in appearance, and is not readily to be distinguished when on the wing from the *Dicroramphæ*. It is to be taken in May and June, and sometimes in July; but whether there are two broods or one straggling one is open to question.

P. oblongana, Haw.,=*marginana*, Haw.,=*similana*, Wilk.—Distributed throughout, but local, and it appears to be more of a woodland species than the preceding; its capture has been recorded from Folkestone, Dover, Tunbridge Wells, and Strood; Haslemere, and Croydon.

P. fuligana, Hub.,=*ustulana*, Haw.,=*carbonana*, Db.—Much scarcer than the last species, but it appears to be nearly as widely distributed, specimens having been captured at Tilgate Forest, Coombe and Darenth Woods, Folkestone, and Hastings.

(To be continued.)

MICRO-LEPIDOPTERA NEW TO THE BRITISH LIST.

By J. B. Hodgkinson.

Trifurcula pallidella, *Zell.*

During the fourth week in August last, when sweeping for *Phygas bisontella* in the neighbourhood of my country house at Dutton, near Ribchester, I netted a small pale yellow moth, which at first sight I took to be a dwarf specimen of *Elachista subochreella*. It temporarily escaped from my net, when I noticed that its mode of flight appeared strange to me. I looked around for the particular grass upon which *E. subochreella* feeds, but could not find any in the locality. I therefore in due course forwarded the example to my valued friend Mr. Stainton for his opinion. He writes to me to say that it is *Trifurcula pallidella*, a rare species on the continent of Europe, and that his examples came from near Vienna. Dr. M. Wocke, in his catalogue of the Micro-Lepidoptera of Europe, says it occurs in Germany, Dalmatia, Italy, Sicily, and also near Brusa, in the north-west of Asia Minor. This species seems therefore to have a wide range of distribution. I have little doubt that I shall again take this interesting addition to our list another season.

TINEA MANCUNIELLA ? N. SP.

During the first week in May last, I was standing on the upper step of the entrance to the Royal Exchange, in Manchester, when I saw a little moth flying about. I captured it with my hat. On my arrival home, my surprise was great to find a very perfect specimen of a *Tinea* unknown to me. This I also forwarded to Mr. Stainton for identification, and he replies that he knows of nothing like it, unless it is an albino *Tinea granella*, as the markings are similar, but the general colour is buff. I can scarcely think it is *T. granella*, for the time of appearance is too early for that species, and I know of no corn warehouse in the neighbourhood. Should this turn out to be a new species, I propose to call it *Tinea Mancuniella*, in honour of the city in which I captured it.

Spring Bank, Preston; December 15, 1879.

LIST OF CYNIPIDES TAKEN IN WORCESTERSHIRE.

BY J. E. FLETCHER.

THE following meagre list comprises the cynipideous galls and their originators hitherto collected by me in Worcestershire: nearly all were taken in the last five years. Without entering on the subjects of dimorphism and alternation of generations, I have divided them into two series, bi-sexual and uni-sexual:—

Bi-sexual Forms.

Liposthenes glechomatis.—A few deserted galls found.

Trigonaspis megaptera.—Galls and imago found.

Rhodites eglanteriæ.—Common.

R. rosæ.—Common.

Disastrophus rubi.—Not often found.

Spathegaster tricolor.—Rather common. In 1876 and 1877 two broods, seemingly, were found, with a lapse of about a month between.

S. baccarum.—Usually abundant, but less so since 1877.

S. vesicatrix.—Two galls found at large; but several were obtained by breeding from *Neuroterus.*

Dryoteras terminale.—Formerly common, but less so during the last two years.

Andricus albipes.—Found last spring in two woods, the only places examined for it: the insect was bred from every gall, the shoots having been placed in water.

A. inflator.—Only a few galls found.

A. curvator.—Common in 1876 and 1877, less so since.

Uni-sexual Forms.

Neuroterus ostreus, N. lenticularis, N. numismatis.—These seem to be common every year.

Biorhiza renum.—Only twice found, at Monk Wood and Sned Wood, and then very few. Imago not bred.

B. aptera.—Only one imago found; but no special search has been made for it.

Cynips Kollari.—Common.

Aphilothrix radicis.—A few of the perfect insect have been captured.

A. fecundatrix.—The gall was common in 1876, scarce in the next two years, a little commoner the last season. Imago not bred.

A. callidoma.—Three galls only have been found at Monk Wood.

A. albopunctata.—Several galls found.

A. solitaria.—One deserted gall found at Old Hills.

A. glandulæ.—One gall found at Monk Wood.

Aphilothrix corticis.—A few old galls found at Old Hills and Temple Laugherne.

Dryophanta divisa.—Usually common, but less so the last three years.

D. longiventris.—Seemingly not common.

D. folii, L. (Mr. Cameron informs me that this is the true name of our species).—Usually common, but scarce in 1878; a little commoner this year.

I conclude with thanks for the notes appended to the translation of Dr. Mayr's work, recently published in the pages of the 'Entomologist,' which have been interesting and useful.

Happy Land, Worcester; December, 1879.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Description of the Larva of Gnophos obscurata.—During the last week, in August, 1877, I took this species not uncommonly on the heaths in the New Forest; and from one of the females eggs were obtained, which duly hatched about the third week of the same month. By the end of November the larvæ were rather over half an inch in length, and still feeding occasionally, though they had not eaten much for several weeks. Towards the end of May following they were full grown, when I described them as follows:—Length about three-quarters of an inch, and rather stout in proportion. The head has the lobes rounded at the sides, but is flat in front, and there is a slight depression on the crown; it is slightly narrower than the 2nd segment, into which it can be partially withdrawn. Body of nearly uniform width, but slightly wider at the middle segments than elsewhere; it is rounded above and below, but the two portions are distinctly separated by a wrinkled raised lateral ridge; the segments are clearly divided, and each is numerously ribbed transversely; the tubercles are raised and rather large for a Geometer; there is also a pair of short but conspicuous pointed prominences on the 12th segment; the anal segment is wedge-shaped, the apex pointing downwards behind. The various prominences and the unevenness of the skin give it a rather wrinkled appearance. Ground colour stone-gray, many specimens having a strong ochreous-purple tinge, others an undecided dull greenish tinge; head stone-gray, thickly marbled in different specimens with purplish brown or smoke-colour; a double pale gray line (the space on the anterior segments filled up with smoke-colour) forms the dorsal stripe; and there is a similarly pale, but threadlike line above the spiracles. On each side of the 5th, 6th, 7th, and 8th segments a dark streak extends from the spiracular region upwards anteriorly, becoming almost black before meeting in the centre on the front of each segment; in the angle thus formed is a conspicuous pale blotch: in one or two larvæ of the brood, however, these dark streaks are entirely absent, though the pale blotches are still distinct. Tubercles white or gray; spiracles large and round, intensely black; prominences on 12th segment gray, with distinct black streak on front of each. Ventral surface stone-gray, or pinkish gray, thickly freckled with very minute dark smoky spots; it has a pale central stripe, edged on each side with a fine irregular smoky line, enclosing together another double smoky line; there is also a pale stripe (varying much in colour in different specimens, in some being pinkish, in others yellowish) between the central stripe and the spiracular region; this stripe is edged inside with dark smoke-colour. The foregoing is a general description of the brood reared from the New Forest eggs; but two larvæ received from Mr. J. Gardner, of Hartlepool, were much darker, and the markings altogether stronger. One of them had a purplish ground, and the dark streaks on segments 5, 6, 7, and 8 were much larger and broader, and the dorsal area altogether much blotched and marbled with this dark colour, which gave it a very irony appearance. The ventral surface was smoky, with the paler central stripe pinkish, and like the others enclosing the double smoky line. The larvæ were fed on strawberry, and the first moth emerged on August 8th, a rather late date.—GEO. T. PORRITT; Highroyd House, Huddersfield, November 8, 1879.

OCCURRENCE OF NOLA CENTONALIS.—I understand a considerable number of specimens of *Nola centonalis* were captured during the past summer, and eggs obtained. This is very interesting, when we remember how long this species and the now no longer rare *Nola albulalis* remained desiderata in our collections.—JOHN T. CARRINGTON.

DEILEPHILA LIVORNICA.—I have recently had brought for my inspection a fine specimen of *D. livornica*, captured August, 1878, at Derwent House, Borrowash, Derby, by Master B. J. Astle.—J. K. Mann; Wellington Terrace, Clifton, Bristol, December 18, 1879.

Lithosia quadra in Somerset.—A male specimen of *L. quadra* was taken in a lightish room in Wells, Somerset, on the 15th of September last. I wish to place the fact on record, as my friend Mr. Hudd, of Clifton, states in his Catalogue of the Lepidoptera of the district, "A single specimen was taken some years ago by Mr. Bolt on a gas-lamp in Bristol. The only record in the district." I have taken nothing worth notice save one *Xylina petrificata* this season at sugar. My old visitant, *Polia flavocincta*, came, though in lessened numbers. I have, however, a few series of four at the service of any one wishing the species.—H. W. Livett; Wells, Somerset, November, 1879.

New Locality for Dipterygia pinastri.—It may be interesting to northern entomologists to learn that this insect, which seems generally a southern one, appeared pretty commonly at sugar last summer, at Alderley Edge, near Manchester.—H. H. Corbett; Ravenoak, Cheadle Hulme, near Stockport, November 21, 1879.

Strange Food for Hydrœcia micacea.—A friend wishing to breed a few *H. micacea* collected some larvæ. Part of these escaped from the breeding cage, and one of these ate its way into the middle of a loaf of bread, where it was there discovered by a young lady, when cutting the bread, to her great disgust.—R. Kay; Bury, Lancashire.

Captures in Scotland.—It may interest some of the Scotch readers of the 'Entomologist' to know that I captured a specimen of *Emmelesia unifasciata* in this district last July. I had the pleasure of taking also seven fine specimens of *Plusia bractea* at the coast in the beginning of August. Amongst other species taken this season I may mention *Phycis abietella*, *Coccyx cosmophorana*, and *Mixodia rubiginosana* (*Bouchardana*). — Wm. Watson; Newfield House, near Johnstone, November 24, 1879.

Asthena sylvata.—I think it might be interesting to Mr. G. C. Bignell and others to know that *A. sylvata* has been exceedingly abundant here this year. Thirteen eggs deposited by a captured female hatched out, and I successfully reared the larvæ on birch to about three-quarter size, when I sent them to a correspondent, but I have not heard anything more about them since.—J. HARRISON; 7, Victoria Bridge, Barnsley.

TORTRIX FORSTERANA.—Mr. Weston has recorded that Mr. Howard Vaughan bred some numbers of this species from larvæ feeding on ivy (Entom. xii. 219). In 1870 I bred some twelve or fourteen specimens from larvæ and pupæ found in rolled ivy leaves in the gardens of the Royal Botanic Society, Regent's Park. In the 'Entomologist's Weekly Intelligencer' (vii. 127) I find the Rev. E. Horton describes the larva, also from ivy. This ivy pabulum is curious, and I believe has not been noticed on the Continent, although Heinemann, in his 'Schmetterlinge Deutschlands, u. d. Schweiz,' says: "The larva in May on ivy, honeysuckle, bilberry, &c." The greater part of this information is probably derived from Stainton's 'Manual,' where we read, "larva on ivy, honeysuckle," &c. Of other continental authorities, we find Treitschke says, "the larva of *T. adjunctana* feeds between drawn-together leaves of *Pinus picea*." In the 'Isis' for 1848, Madam Lienig gives *Vaccinium uliginosum* and *Ledum palustre* as its food plants. Mr. C. G. Barrett states, on the authority of Zeller, that in Germany it occurs mostly "in fir woods, among *Vaccinium myrtillus*, on which it seems to feed." It was from this plant that the *Ober-Albula* specimens were beaten out (Stett. Ent. Zeit. xxxix. 99); is it the food-plant of our small Scotch form? We know the larvæ of the genus Tortrix are especially polyphagous, but if this be the case with *T. Forsterana* it is strange that ivy and privet should be more generally selected in Britain. The life-histories of our Tortrices have been almost entirely neglected; surely many of our lepidopterists would find this an easily worked and paying field in which to labour. If it were cultivated, the gain to our knowledge of species, by the earlier states being described, would be immense. Take the case now before us. We know generally next to nothing of the life-history of a species whose larva and pupa were well figured, by Albin, one hundred and sixty years ago (1720). He says "The caterpillar was of a muddy green, spotted with white. It was found feeding on an oak in Cain Wood the 27th of May: it spun up on the 30th of the same month, and changed into a chrysalis; and the 22nd June came the moth, of an olive colour, spotted with brown." The larva, pupa, and imago are figured on plate 62 (figs. *a—d*).

The Rev. E. Horton's fuller description is as follows:—"Larva: olive, sides yellowish, legs and head brown, shield lighter brown, with darker irregular hind border. Two black marks on 13th segment, spots slightly paler. On ivy, May 21st. Pupa: black, serrated on upper edge of segments: within leaf May 24. Imagos emerged June 6 and 15."—EDWARD A. FITCH; Maldon, Essex.

ABUNDANCE OF EUPITHECIA SUCCENTURIATA LARVÆ.—On the second Saturday in September I went to Wallasey in search of the larva of *Eupithecia innotata*, and on my way to the collecting ground met with *Eupithecia succenturiata* larvæ in plenty, and at the same time took many cases of *Coleophora*, especially the cases of *Coleophora albicans*. As I did not want *Eupithecia succenturiata* larvæ, and knew, even if I did, I should be sure to see them more numerously by lantern light, I consequently pushed on, and secured the much-wanted *E. innotata* larva. On my way back I met two young friends who had been collecting, and prevailed upon them to keep me company. After dark we could see the larvæ of *E. succenturiata* in twenties on the upper parts of the mugwort plants, whilst during the daytime they are only to be found on the lower portion of the plants, on or amongst the twisted or dead leaves. Few but sickly larvæ remain on the green leaves; hence those who will persist in beating for these larvæ do not get many, and most of those obtained by this process are ichneumoned; whilst by lantern light they may be seen moving about just at dusk, and sitting eating the leaves, or in repose later on where they have fed, but they always retire to the base of the plants at daybreak.—C. S. GREGSON; Rose Bank, Fletcher Grove, Edge Lane, Liverpool.

APAMEA UNANIMIS.—I have to record the occurrence of this insect on Hackney marshes in abundance, over the same ground where for many years few were to be obtained by the most careful searching. In May last I obtained nearly a hundred pupæ in two journeys: these produced imagines the end of June and July, being quite a month later than usual. The larvæ hybernate and spin their cocoons in April: these may be found under decayed bark on willows, in stems of thistles, burdock, teazle, or in fact anything that affords sufficient concealment.—W. MACHIN; 22, Argyle Road, Carlton Square, E., Dec. 18, 1879.

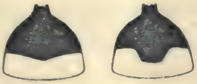
ZYGÆNA FILIPENDULÆ AND ITS PARASITES.—Last year I obtained seventy pupæ of *Z. filipendulæ*, from which I bred thirty-eight imagos, five Diptera, two *Tachina larvarum*, Linn., three *Exorista vulgaris*, Fall., and five small ichneumons (*Apanteles* sp. ?), the remaining twenty-two standing over until this year, from which I obtained twenty-two *Mesostenus obnoxius*, eleven male and ten female, between June 19th and July 3rd, the males preceding the females about eight days. The parents of *M. obnoxius* evidently pierced the victim when nearly, or quite, full-fed; for the larvæ of *Filipendulæ* make the usual cocoon, and change to pupæ; the parasite larva feeds within the pupa, and when full fed constructs a strong pupa case within, of the same colour as the outer, and attached to it, forming a part and parcel of the outer covering; the remains of the pupa case of *Filipendulæ* is generally found at one end of the outer case, and the old larva skin at the other. Mr. Meade named the Diptera, and Mr. Fitch the ichneumons.—G. C. BIGNELL, Stonehouse, Nov. 19, 1879.

MESOSTENUS OBNOXIUS, *Gr.*—The above note upon *Mesostenus obnoxius* most satisfactorily fixes a previously unidentified life-history; the parasite so minutely referred to in the 'Entomologist' (vol. iv. pp. 125-26) by Mr. Henry Moncreaff was clearly *Mesostenus obnoxius*, Gr. This ichneumon has hitherto been considered rare in Britain; there are but two specimens (both females) in the National Collection, and these, I believe, are both referable to the common *M. ligator*. This year, curiously, I have received *M. obnoxius* from both Mr. W. P. Weston and Mr. T. R. Billups, as well as from Mr. Bignell. Mr. Weston's specimens are likewise bred from one year old cocoons of *Zygæna filipendulæ;* and another point in this moth's economy has been elucidated by him, for he found *Anomalon fibulator*, Gr., a frequent parasite; this species, however, invariably emerged the first year. Mr. Billups' single specimen (a very dark female) was captured, but what is most interesting is the variation exhibited by *M. obnoxius* in these three envoies. I specially called Mr. Bridgman's attention to this, and he has added the following note, in which it will be seen how neuration, puncturation, sculpture, and size all vary greatly; there are also other minor variations, such as the white ring in the antennæ of the females; the colour of legs, especially anterior pair in female, &c. C. G. Thomson, in his 'Opuscula Entomologica' (p. 516), does not mention *M. obnoxius*, but he describes a closely allied new species as *M. suborvalis.* There are also five specimens of a distinct n. s. in the Museum British Collection. There is much yet to be learned on the parasites of the closely allied *Zygænidæ.* Mr. J. B. Bridgman has *Casinaria orbitalis*, Gr., bred from *Zygæna trifolii;* Herr Brischke bred *Cryptus migrator*, Fab., from *Zygæna ephialtes*, L. (= *Peucedani*, Esp.); while Rogenhofer bred *Cryptus fumipennis*, Gr., probably only a variety of *C. migrator*, from *Z. Læta;* and Dr. Giraud bred *Cryptus zygænæ*, Gir., as well as this species (*M. obnoxius*), from *Z. Carniolica*, Sc. (= *Onobrychis*, W. V.). In Giraud's record of parasitism it is also stated that *Campoplex decipiens*, Gr., was bred from *Z. filipendulæ*, and that M. Fallou bred *Anomalon zygænæ*, Gir., from the larvæ of *Z. occitanica*, taken at Celles-les-Bains (Ardèche) in May, 1869, upon *Dorycnium subfruticosum.* F. Boie has also recorded in the 'Stettiner Entomologische Zeitung' that he bred *Cryptus zygænarum*, Ratz (= *obscurus*, Gr.), on May 29th, from *Z. trifolii* and *Cryptus filipendulæ*, Boie; on 5th July, from *Z. filipendulæ.* Thomson has also lately (1873) described a *Cryptus* (*Spilocryptus*) *zygænarum*, n. s., which was bred in Zealand (Denmark), by Drewsen, from *Z. filipendulæ.* Speaking of the Braconid genus *Rogas*, Haliday tells us, "De vita et indole nil fere traditum est. Species quædam e larva *Zygænæ filipendulæ* Neesio prodibat.' Lastly, we must state that two or three *Chalcididæ*, especially *Chalcis intermedia*, Ns., and *Monodontomerus obsoletus*, Fab., have been bred from *Zygæna* cocoons.—EDWARD A. FITCH.

MESOSTENUS OBNOXIUS, *Gr.*—The male of *M. obnoxius* appears to be variable. I have, through the kindness of Mr. Fitch, been enabled to examine several specimens of this insect from different quarters, and I find that the areolet varies considerably in width; sometimes the sides are very close together, and the outer nervure is so fine that it almost appears to be wanting; the abdomen also varies much in width, the normal form being elongate-ovate; the 3rd segment being the widest and the same breadth at the base as at the apex, the 1st and 2nd tapering from this; whilst in one specimen, also received from Mr. Fitch, and one in my own collection, the 1st, 2nd, and 3rd segments are in one instance nearly, and in the other quite, of equal width, and the sides almost parallel. Taschenberg says that the 1st segment is without tubercles; this feature is not constant, as in a small specimen I have (only about half the size of those bred by Mr. Bignell), the tubercles are very distinct, and the portion behind them, instead of tapering, is quite quadrate.—John B. Bridgman.

Limneria lugubrina.—On the 14th July last I gathered several flowering heads of wild carrot (*Daucus carota*) that I found growing on the tops of the cliffs, under the Plymouth Citadel, from which I bred, between the 14th and 30th August, many *Œcophora flavimaculella*, and its parasite *Limneria lugubrina*, Holmgr. Mr. Fitch, with his usual kindness, named it for me, and at the same time observed that it was new to Britain.—G. C. Bignell; Stonehouse, Plymouth.

Odynerus parietinum, *Linn.*—During the first week of July, 1879, I noticed several specimens of a fine *Odynerus* in the windows of one of my rooms. At first I thought they were a very large variety of the common *O. parietum*, but all being so exceptionally large I captured three, and then at once saw they differed from that species not only in size, but in general appearance. Especially noticeable was the band on the first segment of the abdomen. Shortly after this, through the courtesy of the author, I received a copy of Mr. J. B. Bridgman's '*Chrysididæ* and *Aculeata* of Norfolk.' In looking through this admirable list, which notices 246 species as occurring in the neighbourhood of Norwich, and contains so many valuable observations, I found "*Odynerus parietinum*, Lin. = *parietum*, var. Smith. Not uncommon in some seasons. There is a very good figure of this distinct, fine species in Curtis's 'British Entomology,' iii. 137, female." This at once reminded me of my insect, and on sending specimens to Mr. Bridgman their identity with *O. parietinum* was confirmed. *Parietinum* is an altogether finer species than *parietum*, the apex of the posterior tibiæ are dark, and the abdominal band is more sharply and deeply interrupted, not regularly angular or uniform as in *parietum* (see figure). If Smith really knew this species it is difficult to think how he could have overlooked it, although the points mentioned are certainly



Parietum. Parietinum.

First segment of abdomen.

somewhat inconstant in the variable and common *O. parietum*. There is no specimen of the true *O. parietinum* in the National Collection, but Curtis's figure is, as usual, very fine. Illiger was the first who clearly differentiated the two Linnean species, but Wesmael reunited them in his monograph (Mon. Odyn. Belg., p. 24, and Supp., p. 6). The *O. parietinum* of Fabricius, Schrank, or Panzer is not this species.—EDWARD A. FITCH; Maldon, Essex, August, 1879.

THE GLOWWORM.—Near midnight, the 8th of October, my neighbour, Mr. Johns, of St. Marychurch, travelling between Cherston and Dartmouth, in Devon, when about a mile from the former place, observed four glowworms shining brightly in the grass by the roadside, and brought one of them, alive and active, to me the next day. Mr. Knapp, in his pleasant 'Journal of a Naturalist,' says that glowworms can hardly be said to shine after the middle of July, except that he has "repeatedly noticed, deep in the herbage, a faint evanescent light proceeding from them, even as late as August and September." And then he describes one particular occasion, a warm, dewy evening, September 28th, 1826, when he saw multitudes of evanescent sparks in the grass. But "instead of the permanent green glow that illumines all the blades of the surrounding herbage, it was a pale transient spot, visible for a moment or two, and then so speedily hidden that we were obliged, in order to capture the creature, to employ the light of a candle." (*Op. cit.*, p. 303). But the fact I am now communicating occurred even much later in the season than this; and the display of light was not to be distinguished from its summer brightness.—P. H. GOSSE; Sandhurst, Torquay.

MYCETOPHAGUS QUADRIGUTTATUS, *Müll.*—From the numerous enquiries I have received for this insect it would appear to be by no means common. I find it fairly plentiful in spring and autumn in a feeding-bin in one of my cow-sheds. This bin is nothing more nor less than a narrow portion of the shed fenced off, and filled about half full of clay, firmly rammed down. A few old boards are placed on the clay, and it is attached to, and in the dust and seeds beneath these boards, that I find the beetle. It would seem that the grand secret of the beetle's presence lies with the boards, for I have been unable to find it in any bin without these loose slabs. On what does the insect feed? A fine brown powder comes off the wood when handled, similar to, if not identical with, that produced by dry-rot; but I have found nothing of a fungoid nature, unless this may be called so. I shall be pleased to send a few unset specimens to any gentleman in want of this species.—THOS. H. HART; Kingsnorth, Ashford, Kent.

PRIONUS CORIARIUS AT RICHMOND PARK.—Whilst digging for pupæ in this park on the 1st inst., I came upon a dead specimen of this beetle at the roots of an oak: the specimen is somewhat imperfect.—N. C. GRAHAM; November 3, 1879.

COLEOPTERA BROUGHT DOWN BY FLOODS.—It sometimes happens that a very extensive assortment of such beetles as live on the ground or among low herbage may be fished out of the water in time of floods. During the frequent inundations which have happened this year in the Aylesbury district I have thus met with many individuals, but very few species. *Carabus monilis* and *C. nemoralis* (the former by hundreds), *Clivina fossor* and *C. collaris*, *Byrrhus sericeus*, *Pœcilus cupreus*, *Amara cursor*, *Notiophilus biguttatus*, and three species of *Agriotes*, are all I could distinguish among the heaps I searched over. From these captures either the present is a very unentomological season or central Bucks is a very unentomological district.—C. R. SLATER; 18, Wray Crescent, Tollington Park, N.

LOCAL COLORATION OF INSECTS.—On comparing two series of *Aromia moschata*, the one captured by myself at Tottenham, and the other collected by my father (J. W. Slater) in the East of Europe, I was struck with the fact that whilst the former were almost all bright green, the continental specimens were of a reddish bronze. I should like to know if this difference has been observed by others, or if it is merely accidental.—ID.

NOTES ON THE LARVA OF CHRYSOPA.—On August 21st, 1879, I found a number of eggs of a species of *Chrysopa* on an ivy stem. The larvæ had just hatched, but were still on the egg-stalk. They were semitransparent, and seemed to experience some difficulty in descending from their elevated position. The antennæ were very long and three-jointed; the third joint is shorter than the other two, and the basal joint is very thick; the antennæ are covered with scales, which make them appear rough. The mandibles are huge curved organs, serrate on the inner side at the tip. The maxillæ are three-jointed, lying forward between and below the mandibles; the middle joint is the longest. The eyes are large, and there are no ocelli. The corneal facets are very prominent, so much so that the eyes look like a collection of ocelli rather than a single compound eye. There is a bristle above and below each eye, and four others arranged in a quadrangle on the head. The labrum is shield-shaped with two long horns. The femora are short, the tibiæ long, with rows of hair. The tarsi are one-jointed, and provided with two hooks and a wineglass-shaped sucker. The prothorax is short and broad; the mesothorax has two papillæ bearing hairs; the metathorax and the six following segments are covered with similar hair-bearing papillæ, of which some, especially the lateral ones, are double. The abdomen then narrows, finally dilating at the tip. The animals fed on aphides of any kind, and eventually one ate up the other three in the box with him. They seize the aphides with their mandibles and suck them dry, then, lifting them on the end of the mandibles, place them on ther backs, where they are held by the long hairs. Often the aphis resists, trying to beat off the *Chrysopa* with its feet, but the fight is not of long duration. Sometimes when there are no more aphides the *Chrysopa* places pieces of stick and other rubbish on its back. It is probable that the *Chrysopa* so covers itself to conceal itself from the aphides, among which it feeds. But it seems to me that the larva of *Cassida*, which similarly bears its excreta on its back, does so to mimic the *Chrysopa* larva rather than to conceal itself or shade itself, as has been suggested, from the sun. On September 2nd one changed its skin. When I saw it, it had firmly fixed itself by its tail to the glass of the box in which it was confined, and was nearly free. The limbs lay folded together, and were transparent; it extricated itself from the skin by wriggling the body, standing almost upright on its tail. Previously to this all had been becoming darker; now the one who had cast his skin was quite clear, but he very soon got darker, being spotted with dark grey on the belly and dark in colour on the back. Shortly after, this one ate up all the others who had grown much more slowly, and were not so far advanced. Now the mandibles are reddish yellow and transparent, darker at the tip; the last joints of the maxillæ are black; the head is marbled with a purplish grey; the back is of a dark brown, the hairs clear and matted. The limbs are also transparent, and still bear the little suckers on the tarsi. The abdomen is white, with grey spots. The animal has remained quiescent for some time lately, the supply of aphides having now ceased, owing to the unsuitable weather, and I conclude that the animal will hybernate, and probably enter the pupa state about May, for it is by no means full grown yet.—H. N. RIDLEY; Bishopstone, Hereford.

WEST LONDON ENTOMOLOGICAL SOCIETY.—The Annual Exhibition of this Society was held on 4th and 5th December, 1879, in the Church Room, St. Mark's, Grosvenor Square, W. Most London entomologists look forward to seeing a good show at the West London Exhibition, but this year the Society outdid itself. Much credit is due to all the members who exhibited and otherwise helped, but to the President, Mr. E. G. Meek, and the Honorary Secretary, Mr. Godwin, are especially due the thanks of the Society and visitors. The former exhibited the fine collection of Lepidoptera formed by the late Mr. Waring, of Norwood. Being one of the oldest in the country, this collection contains examples of nearly every species ever taken in this country. Dr. Harper sent in four drawers of the genus *Peronea*, which are exceedingly interesting, although perhaps a little crowded, but if that is a fault it can easily be remedied. Mr. Howard Vaughan showed a drawer of plumes (*Pterophorina*), also a drawer of *Cidaria russata* and *C. immanata*. The latter was of interest in exhibiting geographical variation, besides being very beautiful series. Mr. Vaughan also exhibited a long series of *Cidaria reticulata*, from Windermere. Mr. Briggs' varieties of Lepidoptera commanded great attention. *Lycæna Corydon*, a fine drawer, two hermaphrodite *Anthocharis cardamines*, five *Fidonia atomaria*, one being black as *Boletobia fuliginaria*, &c. Mr. Fry sent two drawers of the genera *Dianthœcia* and *Polia;* also side by side specimens of *Hadena assimilis* from Scotland and Iceland. Mr. Meek showed, in addition to the large collection already mentioned, *Nonagria sparganii*, new to the British list;

Platypteryx sicula and its preserved larvæ from Bristol; *Boletobia fuliginaria*, captured in the Old Kent Road, by Mr. Upton, on August 3rd last; also series of *Eupœcilia gilvicomana* added to British list this season, and series of *Phlœodes crenana* from Scotland. Mr. Boden exhibited a beautiful case of varieties of his own capture, including *Colias Edusa*, *Thecla rubi*, *Angerona prunaria*, *Hibernia leucophearia;* also specimens of *Phoxopteryx upupana*, *Penthina fuligana*, *Coccyx pygmæana*. The Secretary sent a very interesting case of the life history of *Argyrolepia æneana*, showing the way the larva feeds in the stems of *Senecio Jacobæa;* Mr. Simmons a case containing *Deilephila galii*, *Cucullia gnaphalii*, *Plusia orichalcea;* also examples of foreign Lepidoptera captured about the London Docks. Amongst the other orders of insects were Coleoptera, several drawers shown by Mr. Bull. Insect anatomy was shown through microscopes by Mr. Chas. Wyatt. The room was tastefully decorated with cases of natural-history subjects, contributed by Messrs. Meek, Dow, Beven, Anson, &c. The Society is to be congratulated upon filling a large room with so many valuable specimens and beautiful objects. The promoters of the exhibition must have been gratified with the evident appreciation of the large numbers who attended on the two evenings it was open.—J. T. C.

OBITUARY.

Thomas Atkin.—Thomas Atkin was born at Stapleford, May 5th, 1813, and died November 8th, 1879, at Nottingham. He was brought up as a warper of laces, but changed this occupation to that of a machine fitter. For the last thirty years of his life he took an active interest in Natural History, especially Entomology. This taste gained for him many friends amongst the naturalists of the Midland Counties. One of the founders of the Nottingham Working Men's Naturalist Society, he from time to time filled the offices of President and Vice-President, and served on the Committee, of that Society. He was otherwise useful in reading papers, demonstrating the microscope, &c. In such high respect was he held by the members that four of them carried him to his last resting-place.—J. T. C.

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INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

By J. B. Bridgman and E. A. Fitch.

No. I.—INTRODUCTION.

Our previous articles in the 'Entomologist' (Entom. xi. 34, 156) have shown that the interest in Ichneumons is greater than had been expected. During the past year we have received some hundreds of specimens for determination, many communications asking for a satisfactory guide or comprehensive English work on the group, and not a few promising to take up this interesting branch of Entomology as a special study if we can only recommend a starting-point. To this last enquiry we now attempt an answer in a few introductory papers on British Ichneumons generally. In the collections we have received it has also been apparent what a vast number of insects (belonging to totally different families), of very different shape and structure, may be comprehended under the name of an "Ichneumon fly;" so not only is new information to be given, but much old knowledge is to be corrected.

First, it may perhaps save a great deal of trouble and confusion if we describe the principal parts made use of in the discrimination of the Ichneumonidæ, and illustrate them clearly, as is the case on the accompanying plate.

To commence with the head:—Fig. 1 *a*, gives a front view; fig. 1 *b*, a side view: *a* represents the antennæ, of which a^1 is called the scape and a^2 the flagellum; in Ichneumons the joints are numerous, and as usual are numbered from the base; the antennæ are mostly setiform or setaceous; *b b*, represent the eyes; *c*, the ocelli, which are always on the vertex; *d*, the face; *e*, the clypeus; *f*, the labrum; *g g*, the mandibles; *h h*, the labial palpi; and *i i*, the maxillary palpi. In Fig. 2, *A* is the mesothorax, *B* the scutellum, *C* the metathorax, and *D* the abdomen. The neuration of the wings is of the utmost importance, and although the nomenclature varies it is well that great attention be given to the accompanying explanation, which is after Haliday:—

AREOLÆ

(*Left fore wing.*)

1. Costal.
2. First humeral.
3. Second humeral.
4. Third humeral.
5. Stigma.
6. Radial.
7. First cubital.
8. Second cubital (areolet).
9. Third cubital.
10. Prædiscoidal.
11. Podiscoidal.
12. Externomedial.
13. Anal.

(*Left hind wing.*)

1. Costal.
2. Præbrachial.
3. Pobrachial.
4. Axillary.
5. Radial.
6. Cubital.
7. Discoidal.
8. Anal.

NERVI.

(*Right fore wing.*)

a d. Costal.
b g d. Subcostal.
b q. Anterior, or præbrachial.
c w. Posterior, or pobrachial.
c y w. Axillary.
e k. Metacarpus.
h i j k. Radius (3 abscissæ)
l o. Cubitus.
r t. Anal.
g p. p v. Brachial recurrent.
u y. Axillary recurrent.
i l. j n. Intercubital recurrent.
l q. Interior discoidal recurrent.
m s. Exterior discoidal recurrent.
q r. Posterior discoidal recurrent.

(*Right hind wing.*)

$\alpha\ \beta\ \gamma$. Transverse anal.

Of the legs—1, is the coxa; 2, the trochanter; 3, the femur 4, the tibia (with apical spines); 5, the tarsus (of five joints); 6, the claws. Figs. 3 show the different forms of abdomen:—3^a, is sessile; 3^b, almost sessile; 3^c, subsessile; 3^d, subpetiolated; 3^e, petiolated, *a* is the petiole, *b* the post-petiole. Fig. 4 shows the abdomen, with the aculeus or ovipositor hardly exserted in *Ichneumon* 4^a; and very long in *Rhyssa* (Pimplidæ), 4^b.

The terebrant Hymenoptera, which are distinguished by having an ovipositor and no sting in the female, are primarily divided into two sections: one, in which the three great divisions of the body are less distinctly marked than in the higher

Hymenoptera and which have a caterpillar-like phytophagous larva, comprises the sawflies, or Tenthredinidæ; the other section comprises seven tribes of mostly parasitic insects, in which the division between the thorax and abdomen is very distinct, and all have legless, entomophagous (except part of the Cynipidæ), larvæ. These have been tabulated as follows, by Latreille:—

A. Ovipositor simple.	
a. Ovipositor partially coiled, and proceeding from near base of abdomen.	1. CYNIPIDÆ.
b. Ovipositor straight.	
* Ovipositor of three pieces.	
† Antennæ straight.	
‡ Abdomen inserted at extremity of metathorax.	
§ Two recurrent nervures.	2. ICHNEUMONIDÆ.
§§ One recurrent nervure.	3. BRACONIDÆ.
‡‡ Abdomen inserted upon the back of metathorax.	4. EVANIIDÆ.
†† Antennæ elbowed.	5. CHALCIDIDÆ.
** Ovipositor tubular.	6. OXYURA.
B. Ovipositor jointed.	7. CHYSIDIDÆ.

This shows the place which the true Ichneumons occupy amongst the parasitic Hymenoptera; the somewhat anomalous and rare *Trigonalys* is included in the family Aulacidæ, which is a subsection of the Evaniidæ. There are of course many other distinguishing characters, but the beginner will soon find it easy to separate a true Ichneumon, with its long, slender, well-defined abdomen, its thickly-veined wings, and its mostly long exserted ovipositor, from a Cephus or Sirex, a Cynipid, a Braconid, a Chalcid, or a Proctotrupid (Oxyura). With the few apterous species there may be more difficulty at first.

The eggs of Ichneumons vary greatly: many are whitish or pellucid, and peduncular in shape, while others are shining, black, and oval; in some species they are merely glued to the outside skins of their victims, while in others the female pierces the prey and deposits its egg within the victim egg, or larva, as the case may be. The means used and difficulties overcome in effecting this oviposition, in certain cases, is most interesting. The larvæ of the Ichneumonidæ are all internal parasites on other insects, hexapods of all orders, and frequently in the eggs of certain Arachnida; a few are hyperparasitic, that is, are themselves parasitic on other hymenopterous parasites. In the case of hexapod larvæ the parasites feed on the fatty tissues of the victim, and continue so to do till its eventual exhaustion, which in many instances is not until the penultimate or pupa state has been assumed, though some parasites have been reared without the host's destruction. Many species are solitary, others gregarious; that is, several examples prey on the same host. The larvæ of many genera spin cocoons, mostly within the puparia of their victims. Giraud, Perris, Walsh, Walker, &c., have held that the larvæ of certain Chalcididæ, belonging to the family Eurytomidæ, were partially or wholly herbivorous; but this is very doubtful, and contrary to analogy; so Dr. Giraud's assertion, that the larva of *Pimpla graminellæ* is only carnivorous in early life and herbivorous for the rest of its existence, greatly needs further confirmation; but see Mr. Cameron's note in Ent. Mo. Mag. xiii. 200. The economy of the Ichneumonidæ is very varied, and will be referred to in more detail later on; however, where practicable, it is recommended that the vast amount of information and the excellent plates, especially the life-history plate ix., of Ratzeburg's 'Die Ichneumonen,' be consulted, more especially his twelve Krankengeschichten in the third volume.

Ichneumon imagos are to be found almost everywhere; they are mostly lethargic in their habits, and are easily captured when running and skipping amongst low herbage or on the leaves of trees. A few species are attracted by flowers, especially the Umbelliferæ; and another fruitful source is the sifting and examination of moss and *débris;* this means of collecting is especially productive of the wingless *Pezomachi*, and other small Cryptidæ. Most species are diurnal in their habits, but a few, such as some of the Ophionidæ, are frequent visitors both to light and sugar. Many species hybernate as imagos. Bred species are known to the student of every order, and we can only express a hope that their preservation was more general.

Our British list contains some of the most beautiful species. The arrangements in black, red, and yellow, amongst the Ichneumonidæ and Cryptidæ, are most varied. The testaceous Tryphonidæ and Ophionidæ are often very beautiful and delicate. While the black Pimplidæ, although generally with a very sombre dark look, comprise some of our largest and most beautiful species, *e.g.*, the very large and pretty *Rhyssa persuasoria* and the black *Ephialtes*, with their long ovipositors; *Glypta*, also, is a pretty genus; but it must not be concealed that many of the genus *Pimpla* have far from a pleasant odour when handled. The Agriotypidæ contains but one genus with a single species; this Mr. Walker was fortunate enough to detect as parasitic on certain Trichoptera, hence it is somewhat aquatic in its habits.

Part III. of the Entomological Society's Catalogue of British Insects contains the Ichneumonidæ. This is compiled by the Rev. T. A. Marshall, and a most laborious task it must have been; but, as might be expected from so conscientious a worker, it is almost perfect, and must remain the standard for all future British work on the subject. The author's remarks (Trans. Ent. Soc. Lond., 1872, p. 259, and Ent. An., 1874, pp. 114—146) should also be consulted. This catalogue is full of the necessary citations and references to the works and monographs of Gravenhorst, Wesmael, Ratzeburg, Förster, Holmgren, and Taschenberg, and to the scattered papers or less important works of Zetterstedt, Ruthe, Kriechbaumer, Thomson, &c.; and of our own Curtis, Stephens, Westwood, Haliday, Desvignes, &c. The later papers or works of Thomson, Kriechbaumer, Brischke, Holmgren, or Vollenhoven, are of necessity not included, as the catalogue was issued on November 4th, 1872. In it 1186 species of Ichneumonidæ are included as British, distributed amongst 136 genera. Of these the author says that at least 15 species are doubtful natives: one of these, certainly, has been confirmed, and there have since been several additions made to the British list, while a few others have been overlooked. The extension of this list will not be difficult. Mr. Marshall had a large number of undetermined British specimens in his possession, the record of which his absence from this country will probably deprive us; however, one of the results of the present Ichneumon revival will be to add many species to the already large British fauna. Another and more important result will, we hope, be a large gain to our now comparatively small stock of knowledge on the parasitism and general habits of the various species; this also will help greatly to their more systematic arrangement, and give a solution to many of the problems connected with those species, of which one sex only is yet known, which happens very frequently throughout the Ichneumonidæ. No country can boast of such an army of working entomologists as Britain, where probably more insects are bred from their earlier states than in all the rest of Europe; under these circumstances the various parasites (especially of Lepidoptera) should be well known, but such is not the case. Had these been preserved, and either sufficiently labelled or recorded by short notes in these pages, the materials at the disposal of British hymenopterists would have certainly developed an English authority and English memoirs on this interesting group; but this we lack. As it is, and as Mr. Marshall has remarked, "progress in Ichneumonology requires a large staff of workers, and a division of labour;" thus either the student of the *Hymenoptera pupivora* must be a first-rate general entomologist, or else co-operation must exist, so that the preyer and the preyed upon may be correctly determined. Erroneous information is worse than useless. Let us, therefore, appeal to the students of other orders to attempt to preserve their bred parasites, which we hope will not be difficult with the following instructions. The knowledge of the internal parasites should surely form part of the life-histories of the various species they affect, and in the case of injurious insects their recognition and preservation is of real practical value.

Since it is extremely difficult to identify Ichneumons, whose specific characteristics are often very minute or obscure, unless some care has been taken in their killing and setting, the following hints as to the best methods to pursue are entered into rather fully. First, as regards killing, there is nothing equal to the fumes of burning sulphur; this permanently fixes the red and yellow with which so many species are marked. Cyanide of potassium changes these colours, more especially the yellows, which it turns into a fine red, and consequently spoils the specimens. This, as well as chloroform, also renders them so rigid that it is with difficulty that the limbs can be displayed. If the insects are killed with sulphur and put into a zinc box, with a little damp sand or a piece of blotting-paper moistened with water to which a drop or two of carbolic acid has been added (of course the insects are not to be laid on the moisture, but put in a wide-mouth bottle or other convenient receptacle), and left for two or three days, they will be in splendid condition for setting; they may even be kept there for a week, provided they be kept cool and not allowed to dry. There are two methods of mounting, each of which has its advantages and disadvantages; no doubt, generally speaking, carding is the better plan, because the insects are less liable to be injured in examination and transit than if they were pinned. Should they be carded it is better to cut a **V**-shaped piece out of the card, and place the head and shoulders over the aperture. Thus made, the piece can very easily and neatly be cut out with a pair of punching-pliers, such as are used by the railway officials to snip the tickets; this allows the examination of the face and under part of the front legs. It is a good plan to leave one wing free, as by this means the side of the thorax and coxæ are exposed, or, better still, to card one specimen on its back when no doubt exists as to the specimens belonging to the same species. In pinning carded specimens a rather long strong pin is a great advantage (No. 14 is a good pin for this purpose). The general directions for neat and successful carding are fully entered into in the next article by Dr. Capron, who is quite a *maestro dell'arte*. If the insects are to be pinned always use a long pin; it is better to have the pin too long than too short, as with the latter many insects must accidentally become damaged whilst handling them. No. 7 was the pin generally used by the late Mr. Frederick Smith, and is a very useful pin, but for some even a larger one may be used with advantage. But whatever size is used the insect should be placed well up the pin, so that the legs may not be injured when stuck into the store-box or cabinet, and besides, it allows room for a label to be put on the pin beneath the insect. For setting nothing is better than two thicknesses of cork fastened on a flat board, and covered with white paper. The legs can then be extended, and the wings held in position by small card braces; if the insects have been kept a day or two in the damp box no difficulty need be experienced with the wings; should they not fall at once into their places they may easily be made to do so by pressing the base of the metathorax gently with the handle of the setting-needle (which may be cut wedge-shaped for the purpose) towards the head, when the wings will immediately fly forwards and downwards. As it will be found better to pin some Ichneumons and card others, when special setting is advantageous, it will be hereafter referred to.

As we have above stated, the Ichneumonidæ have been divided into six principal groups or families, principally by the shape of the abdomen, length of ovipositor or aculeus, and form of the areolet (second cubital areola) if present.

The families of this group may be briefly defined as follows, always bearing in mind that most of these families possess some species or genera which at first sight might be placed in some other family; for instance, in Tryphonidæ we find species with a pentagonal areolet, as *Adelognathus* and some of the *Orthocentrus*, whilst *Orthocentrus anomalus* has an aculeus as long as the abdomen. And in the Cryptidæ the genus *Stilpnus* has the aculeus not projecting.

A. The 2nd segment of the abdomen about four times as long as the 3rd. - - Fam. 3. AGRIOTOPIDÆ.
B. The 2nd segment not more than twice as long as the 3rd, generally subequal.
  a. Areolet of wings a regular pentagon or quadrate, the external nervure sometimes pellucid or wanting.
  * Mesosternum not separated from the mesopleura by a depression (sometimes a very short depression present). Aculeus very short, or hidden. - - - Fam. 1. ICHNEUMONIDÆ.
  ** Mesosternum separated from the mesopleura by a distinct depression, sometimes complete (female sometimes apterous); aculeus projecting sometimes as long as the abdomen. - - - Fam. 2. CRYPTIDÆ.
  b. Areolet small, deltoid, or none.
  † Abdomen depressed, rarely subcompressed at the apex.
  ‡ Aculeus of female very short, often hidden. Fam. 5. TRYPHONIDÆ.
  ‡‡ Aculeus of female long, generally more than half the length of the abdomen - Fam. 6. PIMPLIDÆ.
  †† Abdomen more or less compressed, often very much so; aculeus sometimes hidden, rarely as long as the abdomen. - Fam. 4. OPHIONIDÆ.

A better idea of the generalities of these families can of course be obtained by the beginner from the examination of some typical collection, or, failing this, from Ratzeburg's, Curtis's, or Vollenhoven's figures. The three excellent plates in Vollenhoven's 'Schetsen ten Gebruike bij de Studie der Hymenoptera,' Part 1, will be found very useful, and is cheap at half-a-crown; 'Pinacographia' is very valuable, but expensive.

In the subsequent papers these six families of our Ichneumonidæ will be treated of in both systematic and biological detail.

ON THE PRESERVATION OF PARASITIC HYMENOPTERA.

By Edward Capron, M.D.

It is of above all things necessary to determine the names of the smaller species of Hymenoptera, that they should be set in such a manner that all the important characters should be plainly visible, and that the thorax should not be entirely destroyed by a pin as large as itself, which is generally the condition in which I receive specimens from correspondents. If killed by the ordinary methods, such as cyanide of potassium, laurel, or chloroform, the insects almost always die with the wings folded vertically and the legs contracted, and so rigid are the muscles of this class that, unlike Lepidoptera, no amount of relaxing can be effected by moisture, and the insect is generally useless. After many trials I have found the plan I adopt so successful that I think it is worthy the attention of those who intend to study this most interesting group. In the first place, however, it is necessary to bring the insect home alive, and not damaged by its capture; nothing spoils the appearance of a fine Ichneumon so much as a missing leg or antenna. These insects are so active in a net that they will often give you the slip before you are aware of it and escape altogether. My plan is as follows:—

I take with me a pocket full of medium size chip-boxes, or rather large pill-boxes, and a wide-mouth bottle with a large cork, charged moderately with cyanide of potassium. I place this over the insect in the net, and hold my hand on the top (the net being between) until the insect is just stupefied but not dead. With the smaller ones this occurs almost at once. I then remove it, and examine it with a lens to see if it is worth saving; if it is I transfer it to one of the boxes. By the time I reach home the insect will be as lively as ever, and I then kill it in the following manner:—I take a large white basin and fill it with quite boiling water. When it has cooled a few degrees I take each box and give it a tap to send the insect to the bottom, and then suddenly take the lid off and invert it over the water, again tapping the bottom to send the insect out. In nine cases out of ten the insect falls on to the hot water with its wings expanded horizontally, and the legs stretched out. It should not be left long on the hot water, but almost immediately be lifted out with a camel's-hair brush, and placed into another vessel of cold water. When all are thus killed I take a cup of spirits of wine. It should be of full strength,—the ordinary *spiritus rectificatus* of the Pharmacopœia,—and not methylated, as this is apt to be greasy, and unpleasant to the taste and smell. I immerse each insect in it, and, placing under them an ordinary glass microscopic slide, I lift them out carefully, the insect being on its back. I then brush out the legs, wings, and antennæ, absorb the superfluous spirit by the brush, occasionally drying the latter on blotting-paper or by the mouth, and put it aside to dry. This is accomplished in a few minutes, and the insect can then be easily removed from the slide in the most excellent condition for the setting process, which I will now proceed to describe.

The materials required are some small squares of stout six- or eight-sheet Bristol board, such as is used for mounting drawings, and the following solution: gum acacia, one ounce; white sugar, half an ounce; water two ounces. It should be thoroughly dissolved, and is best made some time, and kept until it is very thick and flows with difficulty. The insect being ready, a rather thick line of gum should be placed on the cardboard about the length of the whole insect, and as wide as the body. The insect should be then lifted on to it, taking great care not to touch the wings with the gum. The head should be well into the gum, and be first raised and placed into position with a needle inserted into the other end of the stick which holds the brush. Then the two front legs should be placed in their right position, and fastened securely by the brush and gum. The wings may then be carefully placed with the wetted brush, and, lastly, the two posterior pairs of legs and the antennæ. The gum should be used freely, as it can all be removed afterwards

The insect should then be placed on one side until perfectly dry; indeed, I leave mine thus prepared until the winter gives me time for their examination. When thus required I place a large drop of water on the insect, and when the gum is well dissolved I again remove it off the board to a cup of clear water, from thence into the spirit, and this time dry it with its back upwards on the glass slide. It may then be removed quite stiff and well-set, and mounted on a piece of thin card with only a slight dot of gum under the thorax.

Though apparently troublesome, the process comes easy enough after a little practice. I have often mounted thirty or forty specimens in a couple of hours, and have succeeded in the smallest Chalcids, and even the most difficult and unruly Cynipidæ. The reason of adding the sugar to the gum is to make it more quickly soluble in water, and it also dries quicker and firmer. Great care should be taken to wash off the gum thoroughly in the last washing, as otherwise the wings might stick to the glass slide. I have tried the same plan most successfully with the Tenthridinidæ, and also with Coleoptera, and even kill bees in the same manner. It is certainly the best way of obtaining perfect relaxation after death.

Shere, Surrey, November, 1879.

THE TORTRICES OF SURREY, KENT, AND SUSSEX.

By Walter P. Weston.

(Continued from p. 9.)

Antithesia salicana, Gn.—Common among the larger kinds of sallow, and occasionally to be met with on the trunks of poplars. It flies boldly and quickly at dusk in June and the early part of July, but is one of the species that does not travel quietly when boxed. It may also be taken plentifully in the daytime at rest on the stems of pollard sallows, and willows.

Spilonota ocellana, Fab.—Common everywhere, and particularly so among whitethorn hedges. The larva appears an ubiquitous feeder, for, besides apple and whitethorn, it affects shoots of alder (*Alnus glutinosa*), and occasionally sea-spurge (*Euphorbia paralias*), and the common dock (*Rumex obtusifolius*). *S. hippophäana*, which derived its name from the larva feeding in united shoots of sea-buckthorn (*Hippophaë rhamnoides*), though ranking for a time as a species, must be considered but a form of this insect. When alive the whitish portions of the wing certainly appear lighter and clearer than in *S. ocellana;* but on rearing a long series no difference can be perceived in the two forms, both of which present similar varieties. The sexes will also pair indiscriminately.

S. lariciana, Zell.—Local among larch (*Larix europæa*), but generally abundant where it occurs. It is as variable as the preceding in colour and markings, but may readily be distinguished from it by having much narrower wings. The moth may be taken commonly in June and July flying at dusk round the larches, but as it usually keeps about ten or twelve feet high up the tree, a long net is very handy when after this species.

S. acceriana, Dup. — Not uncommon among black poplar (*Populus nigra*), and more sparingly among aspen (*P. tremula*). Last year I noticed, adhering to the shoots and leaf-stems of the large-leaved balsam poplar, close to London, some curved case-like appearances, which at first sight I took for the cases of a *Coleophora* larvæ. On examination, however, they turned out to be composed of stout whitish silk with the outside covered with frass. On detaching some from the twigs I found each covered a small hole in the stem, in which a larva was feeding. I kept several of the shoots in water, and reared a series of this insect, the transformations from larva to imago occurring generally within the shoots, which did not appear materially injured by their presence.

S. pauperana, Dup.—The old locality for this insect, given by Stainton in his 'Manual,' was "hedges and lanes near Darenth Wood," but, though frequently worked for, this species is now very scarce there. I met with a single specimen flying slowly in the sunshine over wild rose bushes in Surrey, in 1877, as far as I am aware the first occurrence of this species in that county. I do not know of any captures in Sussex.

S. dealbana, Fröl.—A variable species, and specially abundant in woods and woody lanes.

S. neglectana, Dup.—Local, but generally abundant where it occurs. It is usually to be found on the trunks of large sallow, and sometimes poplar, trees; and occurs freely at Camberwell, Hammersmith along the banks of the river, Surbiton, and similar localities. It may easily be distinguished from *S. dealbana* by the bluish black markings which in that species are of a reddish brown. This is also rather a larger insect, and does not vary.

S. simplana, F. v. R.—Very local among aspen (*P. tremula*). Darenth Wood used to be its chief locality, but the part of the wood where it occurred has been closed to entomologists and the public. It has also been taken in Tilgate Forest.

S. amœnana, Hub.=*incarnatana*, Hub.—Appears both scarce and local in these counties. On one occasion I took a couple of specimens by beating wild roses on Box Hill, but have not worked the locality since. It has not been included in any list I have received.

S. suffusana, Zell.—Not uncommon among whitethorn, but is not a free flyer when disturbed. By beating whitethorn hedges into an umbrella in the early part of May several pupæ of this species may be obtained. If the Tortrix collector selects a favourable hedge for this kind of work, which should be fairly close-trimmed but not thinned, he will find an afternoon's work very profitable, as, besides this species, he may reckon on a series of *Sideria achatana* and *Sciaphila nubilana*, with a large proportion of females of the latter.

S. rosæcolana, Dbld.—Not uncommon among wild and cultivated roses, and generally distributed. The imago appears in June and July, and may be distinguished from the following species, which it closely resembles, by its rounded costa, and also by its earlier appearance.

S. roborana, Treit.—Fairly common among roses. The imago seldom appears before August, when *S. rosæcolana* is over.

Pardia tripunctana, Fab.—Common everywhere.

Aspis Udmanniana, Linn.—Common throughout. It may be bred in plenty from shoots of bramble (*Rubus*), which the larva curls round and unites with the last leaf, making a very conspicuous bunch.

Sideria achatana, S. V.—Not uncommon among whitethorn; it appears to prefer hedges that are kept cut tolerably close. When beaten out it usually flies down or drops, and is more often to be found near the bottom of the hedge, whence the pupa may also be beaten. When bred the colours of this insect are very bright. It is commoner in Surrey than in the other two counties, but in neither is it scarce.

(To be continued.)

NOTES ON LEPIDOPTERA IN THE ISLE OF WIGHT, 1879.

By Richard South.

The months of May, June, July, and August were not more genial at Ventnor, in the Isle of Wight, than on the mainland; if anything, perhaps a little less so, the island being so much exposed to the prevailing south-west wind, which at times was icy cold. Again, fogs of a persistent character would cover the island for days together, rendering collecting not only poor in results, but decidedly unpleasant to the collector.

Many of the Diurni were late and scarce, notably *Anthocharis cardamines*, *Lycæna Adonis*, and *Polyommatus Phlæas;* of the last-named I only observed two specimens, and those not until the end of August.

Melitæa Cinxia was late, but fairly common, though difficult to obtain owing to wind and rain. All species of the genus *Satyrus*, with the exception of *S. Ægeria*, were abundant. *Arge Galathea* and *Pyrameis cardui* were in large numbers.

Larvæ of *M. Cinxia* were plentiful from the 6th to 20th of May; a few were picked up both before and after these dates. They were observed in many localities between Sandown and Chale Bay, and at various elevations, some only a few feet from the sea, others on the steep sides of St. Boniface. Dull and even rainy weather seemed to be enjoyed by these larvæ, as on the few occasions when the sun was brightly shining they would be hidden under leaves, clods, &c. I had a striking example of this; for on one dull morning, with a strong wind blowing as usual from the south-west, I came upon quite a colony of these little black fellows busily engaged devouring various kinds of *Plantago*, not *P. maritima* only. Whilst I was securing a few a smart shower came on, but this did not disturb *Cinxia* in the least, though I was glad to hurry to the lee of an adjacent rock and take what shelter it could afford. Presently, the rain clearing off, I ventured from my retreat, and found the larvæ still exposed, with little beads of moisture on their spines, and all anxious to attain the summit of some stem or blade of grass, or other vantage point where they might dry their jackets. That process being accomplished they returned to their interrupted repast. Just then the sun shone forth with some power, and there was a general stampede, every individual being now as desirous of concealment as a while ago it was to expose itself. The larvæ of *Arge Galathea*, *Vanessa Io*, and *Pyrameis cardui* were to be found in plenty.

Of the Nocturni I have nothing of interest to record, except perhaps the paucity of the imagines of *Zygæna filipendulæ* as compared with the host of larvæ seen in May and June. Neither have I much to say of the Geometræ; one or two species were to be had freely. Of these I may mention *Corycia temerata*, *Melanippe galiata*, *M. procellata*, *Anticlea rubidata*, and *Phibalapteryx tersata*. *Abraxas grossulariata* was exceedingly abundant, and varied in marking from dull to pale, but with no very striking varieties. I also met with one specimen each of *Venusia cambricaria*, and *Lobophora viretata*.

Noctuæ were not in great force; many common species did not show up at all. I sugared posts, fences, bushes, and flowers on and about the downs, and now and then the trees in Pelham Woods, using some twenty-four pounds of "mixture," but I was not rewarded with a single insect worthy of note. *Thyatira derasa*, *Leucania pallens*, *Xylophasia sublustris*, *X. polyodon*, *Mamestra anceps*, *Miana strigilis*, *M. literosa*, *Agrotis exclamationis*, *A. corticea*, *Aplecta advena*, and *Hadena dentina* were the only things that came in any number. *Phytometra ænea* was not uncommon in the daytime, but *Acontia luctuosa* and the two *Euclidiæ* very scarce.

Hypena proboscidalis, *Rivula sericealis*, and *Herminia tarsipennalis* were the only Deltoides that I met with. They were in some plenty. Of the Pyralites I took a fine series of each of the *Pyraustæ*, but only saw one *Ennychia anguinalis*; *Stenia punctalis* was very late and scarce; it did not put in an appearance till July 30th; the third week in August *Botys flavalis* began to come out freely; *B. fuscalis* was not common, although its food-plant grew in abundance, and I only obtained one poor example of *B. asinalis*. *Ebulea crocealis*, a fine series bred; larvæ very common. *Pionea stramentalis* was found rather plentifully in one or two little woods near Shanklin, and *Stenopteryx hybridalis* was abundant everywhere.

Of the Crambites, *Platytes cerussellus*, *Crambus pratellus*, *C. pascuellus*, *C. tristellus*, *C. geniculellus*, *C. culmellus*, and *C. chrysonuchellus* were all common, and I bred a fine series of *Ephestia cinerosella* and a few *Phycis ornatella*. *Oncocera ahenella* was not very scarce.

It was amongst the Tortrices that I found most employment. *Œnectra pilleriana*, though extremely local, was not uncommon (Entom. xii. 273). *Peronea hastiana*, a series bred from pupæ found in leaves and terminal shoots of osiers. *P. aspersana*, a series of very small and dark specimens were bred from *Poterium sanguisorba*, but, strange to say, not the round type, although these were common enough on the downs where I found the larvæ. *Penthina gentianana*, bred from teazle heads; and *P. sellana* was not scarce on the downs and at Steephill cone. *Aspis Udmanniana* bred, the larvæ very common in twisted shoots and packets of bramble leaves. *Sericoris littorana*, a series bred from flowers of *Statice armeria*. *S. herbana*, specimens beaten out of a hedge in company with numbers of *S. lacunana*. *Euchromia purpurana*, not uncommon in rough fields; just before dusk is the best time to take this species, as they then get on the wing, but settle again before it is quite dark; a few may be turned up during the day, but in a field where they are known to occur a greater number may be taken by simply standing in one spot, at the right time, than could be obtained by tramping all over the field any other part of the day. *Orthotænia striana* very scarce. *Eriopsela fractifasciana* common; I took a long series of females. *Sphaleroptera ictericana* swarming. *Phoxopteryx comptana* fairly common, but, like everything else, late; there was a second brood in August. *Ephippiphora pflugiana*, unlike *E. brunnichiana* and *E. trigeminana*, was very scarce. A few *E. ephippana* were bred from *Eupatorium cannabinum*. *Endopisa nigricana* very common, flying late in the afternoon over peas in fields; on one occasion I took thirty males in about as many minutes, as they came to a freshly-emerged female that was in a clump of grass at my feet. I afterwards secured the lady herself. *Stigmonota composana* scarce, but this may have been due to the wet and windy weather that existed when it was out. *Dicrorampha politana* occurred freely in one or two localities, and a few *D. sequana* with them. *D. petiverana* was common. *D. saturnana* plentiful, but local. *D. acuminatana*, a few along the upper cliff. *D. senectana*, common in several places along the foot of the downs. *D. simpliciana* amongst mugwort at Shanklin, and a long series of *D. consortana* bred from shoots of ox-eye daisy (*Chrysanthemum leucanthemum*). It is astonishing what rough treatment these larvæ can put up with. A number of the shoots were placed in a tin canister at the time of gathering, brought home, and by chance put away in a corner where for some time they were forgotten. When I happened to come across the tin and opened it, I found a mass of vegetable matter in a very advanced stage of decomposition, and was about to throw the rubbish out, when I noticed a little pale brown pupa just peeping out of a web; so I threw all into a wooden box with a leno-net cover, and in course of time twenty-two imagines made their appearance, which were quite as fine as those more carefully attended to. *Pyrodes Rhediana* was common early in June, flying round hawthorn blossom in the sunshine, when there was any.

Catoptria cana, *C. fulvana*, and *C. Hohenwarthiana* were all common. Of *C. parvulana* I got two, and one *C. expallidana*. *C. pupillana* was scarce. *Eupœcilia atricapitana* was not often met with, but *E. hybridellana* was common and generally distributed, flying just before dusk. *E. rupicolana* was bred from hemp agrimony, and *E. roseana* from teazle heads. *E. ciliana* very scarce. A few examples of *Xanthosetia Zoegana* were taken. *X. hamana* and *Chrosis tesserana* were very common. *Argyrolepia subbaumanniana* obtained in plenty on the slopes of the upper cliff, and *A. zephyrana* nearer the sea. *A. badiana* common among burdock. *Cochylis dilucidana* and *C. stramineana* were not scarce.

The *Pterophori* were represented by *Pterophorus ochrodactylus*, of which I took eight among yarrow. *P. trigonodactylus* not common. *P. acanthodactylus* abundant; larvæ and pupæ on restharrow. *P. parvidactylus* not scarce on the downs, but difficult to see and catch. *P. phæodactylus* very abundant. *P. Loewii*, a few on the slopes of the upper cliff, flying with *P. baliodactylus* and *P. pentadactylus*; the latter very common. *P. lithodactylus*, bred from larvæ on *Inula dysenterica;* these larvæ when young are to be found in the terminal shoots, but later on are difficult to obtain during the day; towards dark, however, they may easily be got, as they then feed exposed on the surface of the leaves. I could not find out where they hid in the daytime. *P. microdactylus*, one only; but *P. spilodactylus* was very common in the larval stage wherever any of its food-plant, *Marrubium vulgare*, was growing; the larva partakes of the colour and character of the plant, and, as it rests when not feeding on the upper side of the leaf and near its base, may readily be overlooked.

Judging the success of the whole campaign from a not unusual point of view,—the mere accumulation of specimens,—it certainly is not grand, but there is another phase of the matter; taking into consideration the abnormal season, and in consequence the few favourable opportunities for working, I am not inclined to be dissatisfied with the practical knowledge obtained of the habits of many species with which I was previously unacquainted.

In conclusion I will relate a curious circumstance that came under my observation on Sunday evening, August 10th. I was walking over Steephill Down, Ventnor, the light was fast declining, the air still and sultry, and a thunder-storm impending. I noticed, just over head, a moth soaring upwards; whilst watching it I became aware of others ascending in like manner, all towering in a spiral flight, and soon lost to view. On looking down I perceived others around me, starting from out of the furze; I made frantic efforts to secure a specimen so as to determine the species, but unfortunately, not having my net, I was unable to do so. I can only say that in size and shape they were not unlike *Plusia gamma*. I was at the time, and still am, unable to assign any cause for this unusual mounting to the upper air.

13, Bonchurch Villas, Ealing, Jan. 7, 1880.

LIFE-HISTORY OF NOLA CENTONALIS.

By W. H. Tugwell.

On the 15th of August, 1879, I had the good fortune to capture two female *Nola centonalis* whilst collecting in Kent. As nothing was known of the life-history of this rare moth I risked spoiling my specimens by keeping them for eggs Both deposited small batches, but only one lot proved fertile; these, thirty-six in number, soon showed signs of vitality.

When first deposited the ova were pearly white, beautifully striated, and somewhat hemispherical in form, *i.e.*, convex above, flattened beneath. In two or three days a small dark central spot appeared, which increased in intensity till the time of hatching, which took place on August 27th. I had a difficult problem to solve, for I had no knowledge of the food-plant of the larvæ, so I collected portions of twelve different plants that grew about the locality of capture of the moths. These were enclosed in a wide-mouth bottle with the eggs directly they commenced to hatch. Being so small, little or no signs of frass could be detected, and feared I had lost all, till the fourth day, when the contents of the bottle were carefully inspected on a sheet of white paper. I was pleased to find three different plants had been eaten. This gave hope, and enabled me to clear away a lot of useless plants. Carefully replacing the larvæ with fresh portions of their food, viz., *Potentilla anserina*, *Lotus corniculatus*, and *Trifolium procumbens*, I left them again four days, and then repeated the inspection. Now the preference for the *Leguminosæ* was decided, *Trifolium procumbens* being evidently the favourite food. I continued to give this plant for a short time, but finding it difficult to keep up a fresh supply, for I could not find it growing near Greenwich, substituted *Trifolium minus* and *Medicago lupulina*, both of which they ate freely. In their early stages they feed on the leaves only, but after the third and fourth moult I observed they had a taste for the flowers, so tried them with the heads of bloom of the common clover (*T. pratense*). They took most kindly to this food, and, being easily obtained, I continued with it till they spun up, which they did from first to second week in November. Doubtless this abnormal time of pupating was induced by being kept in a warmed room, and well supplied with fresh food. In nature they would undoubtedly hybernate. This is shown by six larvæ I had sent to Mr. Buckler. Atlhough these were treated like mine, only in a cold room, after moulting five times they refused to feed up, and hybernated, as did two larvæ with me also. Luckily, by my forçing treatment, the risk of losing them in the state of hybernating was avoided, and enabled me to send a full-fed larva on to Mr. Buckler, and thus secured its portrait by his able pencil.

The young larvæ are a pale brownish yellow, hairy, and rather sluggish, a character they retained through life. If touched or irritated they drop from their food and curl themselves up, and remain thus for some time. They moulted five times at pretty regular intervals, viz.: first moult, on September 6th to 8th; second moult, 16th to 18th; third moult, 24th to 26th; fourth, October 12th to 14th; and the fifth and final was completed by October 26th. No great change of coloration takes place till the fourth change of skin, when a faint fulvous-yellow dorsal line first makes its appearance, and the fleshy tubercles are dark and spot-like. This last character is almost lost in the final moult.

The full-fed larva is, when extended, about half an inch to five-eighths of an inch long, moderately stout, somewhat thickest in the middle segments, attenuating slightly, both anteriorly and posteriorly. The head is small and dark blackish brown. The general ground colour is a translucent brown-pink. A narrow but well-defined yellow dorsal line, and on each of the segments, which are strongly developed, are six small fleshy tubercles, arranged in rows, three on either side of the dorsal line, and from which spring tufts of short brown hair. The spiracle line is not very apparent. The abdomen and claspers are nude, and of a translucent brown-pink shade.

When the larva is about to spin its cocoon it selects a grass-culm or other stem, and, having spun a little pad of silk on it, commences to nibble off portions of adjacent stems. With these it builds out two side pieces like an open boat, the grass-culm forming, as it were, the keel. It is most curious to watch this construction going on. The larva stretches itself out as far as it can reach without absolutely leaving hold of its work, in order to gather the building material, which it brings in, and adds, so to speak, another plank to its house. One larva, which had commenced its cocoon on the side of the bottle and not within reach of this necessary building material, spun the silk pad and very small wing or side pieces; then it appeared quite at loss how to proceed. I observed it thus for two entire days, but it could make no further progress with its work. I then placed some dried grass roots within its reach, and at once the building process went on, and the cocoon was completed. As soon as these side pieces are sufficiently developed, an operation which takes some thirty-six hours' labour, the larva commences at the bottom end to draw over the two edges so that they just meet, and spins them thus firmly together. Working in this manner steadily upward, until nearly closed in, the larva then enters the cocoon, draws over the top or head piece, and then lines the interior with silk. When completed it is both neat and compact, something like the cocoon of *Nola albulalis*, except that it is obtusely blunt at the top or head, whilst *N. albulalis* has it pointed at each end, like the *Zygænidæ*.

By keeping my pupæ in a warm room, the imagines commenced to appear on December 10th, and came out at intervals until December 28th, in all twenty perfect specimens. My treatment of them had been most successful, not losing a single one by death

The perfect insect varies very much indeed. The typical form is almost white, some pure white, without a mark on the wings save the button-like scales; others are grey, with a darker central grey band. Two or three have the usual lines of the superior wings, but no grey shading, the strongest marking generally being the line next to and parallel with the hind margin.

3, Lewisham Road, Greenwich, Jan. 1, 1880.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Reoccurrence of Chrysophanus virgaurea in England.—On August 26th, 1878, during my stay at Cromer, I had the good fortune to catch a female specimen of *Chrysophanus virgaurea*. At first I took it to be a variety of *Polyommatus phlæas*; and it was not till last Easter, when I saw the *C. virgaurea* figured in Mr. Kirby's 'European Butterflies and Moths,' that I had any idea what a prize I had secured. I was not able, however, to obtain any decisive judgment as to its true character, until I had the opportunity a few days ago of consulting Mr. C. O. Waterhouse, of the British Museum. After a careful examination Mr. Waterhouse pronounced it to be an undoubted female specimen of *Chrysophanus virgaurea*. Mr. Kirby says in his book that "although there seems little reason to doubt that it formerly inhabited this country, it has in all probability been long extinct." I am informed that since Doubleday's Catalogue of 1850 it has been altogether excluded from the lists of British butterflies.—C. H. Capel Cure; St. George's Rectory, 15, Grosvenor Street, W., December 31, 1879.

[The specimen above referred to, although a pale variety, is undoubtedly *Chrysophanus virgaurea*, and has the characteristic white line on the under side of the posterior wings well-marked. Chas. O. Waterhouse.]

Life-history of Peronea permutana.—Eggs laid in small patches on the leaves and stems of *Rosa spinosissima*, &c., in August and September. Larva amongst bound-together leaves of *Rosa spinosissima*, on which plant it feeds, generally feeding upon lateral shoots. In form it is slightly appressed, attenuate to anus from the 9th segment. Size three-eighths of an inch. The colour is dull yellowish drab, inclining to olive. Head bright, light-coloured, rather narrow; dorsal region rather darker than the general colour of the creature. Anal plate horn-like, bright;

spiracular region slightly puckered; anal spines large. The general appearance is a bright head and dull yellowish body. Pupa enclosed in a white silky web amongst the leaves; light-coloured at first, afterwards changing gradually to a dull dark brown; the larvæ feed in June, July, and into August; and the perfect insect appears in August, remaining in pupa from two to four weeks, according to the temperature of the season. In 1851 I took this insect at Barnes Common, but have never been there since until a few weeks ago. The locality appears so much altered that I should hardly expect to hear of *Peronia permutana* being ever taken there again. At Wallasey, in Cheshire, its original home, it is likely to remain for years, for its food-plant is spread over a large space of sand-hills. I also met with it at Penmanbach, near Conway, four years ago. Should the Wallasey sand-hills get built over, as is certain to be the case sometime or other, we, or rather those who follow us, must follow it to its mountain fastnesses at the entrance to the pass, from Bangor to Conway, on the Bangor old road.—C. S. Gregson; Rose Bank, Fletcher Grove, Stanley, Liverpool, January 22, 1880.

Tortrix adjunctana.—I thought everybody knew the history of our old friend once called *Tortrix Forsterana;* still it is refreshing and interesting to find the record so far back as Albin: his description of the larva is good. I have bred it from ivy a long time ago, and recently from ivy in our public park, and last season from bilberry (*Vaccinium myrtillus*); I have taken it on the heaths among bilberry for over thirty years. The specimens taken on the moors are very dark, rich coloured, fine examples. It is remarkable that many larvæ which feed upon bilberry are of a fine, rich, dark purplish tint. I have bred a great number of *Ypsipetes elutata* nearly black from this plant, in no way like those feeding upon the willow. The same applies to *Boarmia repandata.*—J. B. Hodgkinson; 15, Spring Bank, Preston, January 5, 1879.

Carpocapsa grossana, remarkable length of Larval condition.—During the autumn of 1877 I collected a quantity of the larvæ of *Carpocapsa grossana* feeding on the fruit of *Fagus sylvatica*, the common beech nuts. The larva is flesh-coloured, with black head and a number of spiracles. It is very lively, and when full-fed it leaves the nut in which it has fed, and seeks a suitable place in which to spin its cocoon. The cocoon is somewhat boat-shaped, tough, and hard. I placed some pieces of cork and rotten wood in the cage, of which they very readily availed themselves. Some of the larvæ also spun up on the outside of the husks of the nuts. About the middle of June, 1878, the first imago made its appearance, and up to the second week in July I had not bred more than six specimens. No more appeared during the year, which I thought very strange, considering the number of cocoons I had. I placed the cage in the garden, exposed to the weather, thinking that some would lie in pupa until the following year, as many other species do. Some of the readers of the 'Entomologist' may remember there were no beech nuts in 1878. I visited localities in four different counties, but, strange to say, not a single nut could be found. I called the attention of some very observant entomological friends to the fact, who also never saw any beech fruit. Now, if the insects had all appeared, as is usual with many species, the species must have become extinct, or found some other food as a substitute, which is rather unlikely. In April, 1879, I was thinking of my *Grossana*, and upon opening a cocoon, instead of finding a pupa as I expected, I was surprised to find a larva as fresh as though it had not been there more than a few days, so I opened another with the same result; altogether I opened five, so thought I had destroyed enough. In less than two months from that time I bred thirty more specimens. There are many Tortrices which pass the winter in the larval state, as most of your readers know, but I never before knew of this insect remaining so long a larva. —D. Pratt; 398, Mile End Road, London, E.

REVIEW.

Index Entomologicus. Part I. Edited by Dr. F. Katter.
London: West, Newman, & Co. 124 pp., fcap. 8vo.

To all corresponding entomologists the need of a special directory must often have been felt, and not unfrequently has the want of an address been the means of stopping many communications. Not long since the 'Entomologist's Annual' aimed at supplying this want amongst British entomologists. International communications are now more frequent, and let us hope will be; the 'Annual' is no longer published. Dr. Katter has just issued Part I. of the 'Index Entomologicus,' in which he attempts to give the addresses and specialities of all European entomologists, together with a list of entomological societies and periodicals.

Part II. will contain a catalogue of newly-described species. In this first list it is almost a necessity that there should be many errors both of omission and commission, and so it is, but their indication and correction is specially asked for by the editor.

The arrangement is not altogether of the clearest, for we certainly think it would have been preferable to have had a simple alphabetical list of the entomologists of each country, instead of the numerous divisions which are included, and which makes the search for an address, the geography of which may excusably be somewhat obscure to a foreigner, a matter of some difficulty. For instance, the entomologists of Germany are divided, first, amongst the respective twenty-six states in which their domicile happens to be; then, again, Prussian entomologists are subdivided amongst the ten old divisions of that country and so on; another distinction is made between those resident in the chief towns and otherwise, so that altogether we have to search through thirty-nine separate alphabetically arranged lists for an unknown German address; it is similar with other countries. British entomologists luckily are only divided into (1) London, (2) Liverpool, (3) rest of England, (4) Scotland, (5) Ireland, and we are sorry to see but three names in the latter division. On the other hand this division into districts is not without its advantages, since it enables the entomologist on his travels to find the names of his brethren of the science in the towns near which he is passing. The purpose of the 'Index Entomologicus' is excellent, but a better system of editing and the co-operation of entomologists generally is needed to make the present work the boon it would be, if perfect; let us hope such will be forthcoming. Anyhow, the thanks of British entomologists are due to Dr. Katter for his timely publication.—E. A. F.

EPPING FOREST AND COUNTY OF ESSEX NATURALISTS' FIELD CLUB.—This Society has been established to further the "Investigation of the Natural History, Geology, and Archæology of the county of Essex, and the publication of the results of such investigation," &c. We heartily wish the Club success; and with a little management we have no doubt it will fulfil the intentions of its promoters. Mr. R. Meldola, the president, and the honorary secretary, Mr W. Cole, will forward any further information; the address of the latter is Laurel Cottage, Buckhurst Hill, Essex.—J. T. C.

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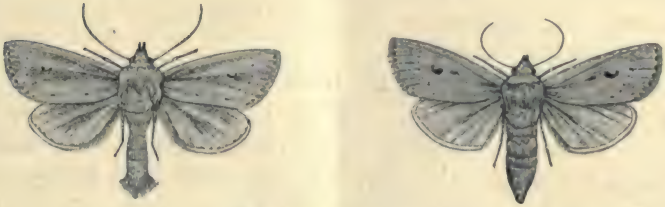
NONAGRIA SPARGANII, *Esper.*

A Noctua new to the British Fauna.



Nonagria sparganii.

To Mr. Sydney Webb, the discoverer of this handsome addition to the British fauna, I am indebted for the following particulars:—

In January, 1879, Mr. Webb exhibited a small specimen of a Noctua at the usual meeting of the scientific committee of the Royal Horticultural Society. The larva from which the first known British example of this lepidopteron was bred was of a bright yellowish green colour, and was found feeding in the stems of *Iris pseudo-acorus.* In confinement this larva fed well upon *Iris pumila,* and, in fact, upon any of the other dwarf forms of *Iris* now so much cultivated in gardens. A hint was thrown out at the meeting by Mr. Webb that the larva, of whatever species it was, might become a serious trouble to horticulturits on account of its voracious appetite.

He further stated that upon careful examination he believed the species to be *Nonagria sparganii,* but the example was so unlike any continental specimens that he deferred publishing an account of its advent until he had confirmed his opinion by future observations. The botanic differences between *Iris* and *Sparganium* are so great that it was scarcely to be expected one insect would attack both plants.

It appears that the further discovery in the summer of 1879 of this larvæ was due rather to an accident than otherwise. Mr. Webb with Mr. W. R. Jeffrey were in search of Lepidoptera in one of the south-eastern counties on a wild gusty day in July last. Finding all the usual methods of collecting failed, these gentlemen turned their attention to the bored stems of the yellow flag (*Iris pseudo-acorus*). Mr. Webb had long noticed these borings in the wild *Iris*, but had hitherto failed to rear the larvæ. The result of the search in that instance was, however, the addition of this very fine species to the British list of Lepidoptera. The familiar green larvæ of the previous season was found last summer in bur-reed (*Sparganium ramosum*), also, thus confirming the species.

Those who have reared the larvæ of *Nonagria sparganii* have been beset with difficulties; one of the greatest is the very large quantity of food required by an individual larva before reaching the pupa condition. Probably the most convenient food is one of the dwarf garden varieties of the *Iris*, but when we remember that a very few larva will consume or waste more than all the plants usually found in a garden, it will be understood how much food may be required for a goodly batch. A further difficulty appears to be the facility with which the larvæ escape from confinement, especial care being necessary to see they do not get out of bounds, for their rambling habits make a search for the lost ones of little avail. Nor do the troubles end with the attainment of the pupa condition of this species. Mr. Webb states that upon emergence of the imago the fluids of the wings take so long to harden or dry, that many are injured both in confinement and in a state of nature. From twelve to forty-eight hours seem to be the normal time necessary for this process of hardening to be completed, and many moths have crippled wings in consequence. The majority of the moths appear to emerge between eight and nine o'clock p.m.; the flight extends from about six to seven in the evening in August and September, like that of *Nonagria fulva*. It can be imagined, therefore, that should the wings be not dry on the afternoon following the emergence from pupa, the moth, in its attempt to fly, loses much of its beauty by the destruction of the ciliæ, or actual tearing of the wings by contact with the surrounding herbage.

The woodcut accompanying this article gives a better idea of the species than would a minute description of the perfect insect, but the following are the chief characteristics:—

The ground colour of *Nonagria sparganii* is a bone-coloured grey, paler along the veins, and with more or less reddish buff interspersed. The principal characters are seven dark dots within the ciliæ of the fore wings, and the shaded central line with its pale ocellus formed by the three or four black dots placed close together. The hind wings of the male have veins dusted with deep grey. There is considerable variation in the intensity of colour in a series of specimens, but the above are the leading features. The continental specimens are very much redder and otherwise differ from any of those as yet bred in Britain. It is a common species on the Continent of Europe, where it is said to feed chiefly on the reed-mace (*Typha latifolia*).

The proper place for this species in our collections is between *Nonagria cannæ* and *N. typhæ*, the imagines having some of the characters of both those species.

We are indebted to Mr. Sydney Webb for kindly lending the specimens, bred by himself, from which the figures are taken.

JOHN T. CARRINGTON.

Royal Aquarium, Westminster, January, 1880.

NOTES ON HYMENOPTERA.

By JOHN B. BRIDGMAN.

HYMENOPTERA, as might be expected from the very unfavourable season just passed (1879), have been unusually scarce in this neighbourhood, more especially the Aculeates. *Anthophora acervorum*, instead of swarming on every sunny bank in early spring, was very scarce. Willow blossoms were almost deserted instead of being alive with several species of *Andrena*; and, later in the season, the brambles, generally so attractive to bees, were almost as free from aculeate visitants as the spring flowers were. The only bee that really abounded was *Bombus virginalis*; these were unusually abundant. Several species of this genus I scarcely saw at all. Wasps were equally conspicuous by their absence. The females of the common garden ant, which are generally met with crawling about everywhere in the middle of August, this past season were rarely to be seen. In spite of the unfavourable season I was fortunate enough to add three species of Fossores and one bee to my Norfolk list, viz., *Crabro podagricus*, *C. tibiale*, *Mimesa equestris*, and *Stelis phæoptera*. Although I searched many times I could not find a single specimen of *Macropis labiata*, and the few Aculeates which were to be seen were all very late, as might be expected. On clearing out some of my boxes, &c., I found a male of *Tetramorium lippula*, one of our rarer British ants, which I had taken in the neighbourhood of this city in 1878, and had overlooked. Sawflies, generally speaking, were also scarce, but still *Nematus Ribesii* were a perfect pest, denuding the gooseberry bushes cf their leaves. The unusual abundance of this insect has already been noticed in this magazine. Several other sawflies were plentiful in the autumn; I never before saw so many *Allantus tricinctus* and *A. scrophulariæ*. In the spring I took about half a dozen of that pretty little sawfly, *Eriocampa nigripes*, flying about the blackthorn.

In Mr. Marshall's 'Catalogue of Ichneumonidæ,' under *Cryptus carnifex*, he gives *C. elegans*, Desv., as a synonym; these are clearly two distinct species. Gravenhorst and Taschenberg did not know the male of *carnifex*. Thomson, in his 'Opuscula Entomologica,' fasc. 5, p. 513, describes both the sexes, under the name of *Hygrocryptus carnifex*, and gives *varicoxis*, Tasch., as the male; it may be so, but Thomson describes the male as having a red metathorax, which quite accords with the two males of *carnifex* I have taken, whilst Taschenberg makes no mention of any colour in this part. Thomson also describes another species of the same subgenus as *Drewseni*, which is evidently *elegans* of Desvignes. This latter name Thomson has given to a n. sp. of *Hoplocryptus*, another of his subgenera, and which name consequently ought to be altered. I have taken two males of another species of the same group of the genus *Cryptus* as *C. carnifex* and *C. elegans*, which I believe will prove to be the male of *C. palustris*, Thoms.; in *lib. cit.*, p. 514, he describes the female only, and says it is very like *carnifex*, but has the metathorax, coxæ, trochanters, and base of petiole black. The female has no white ring on the antennæ; the insect is a little smaller, which agrees exactly with my insects, adding that the third and fourth joints of the hind tarsi are white, and one of them has the first segment entirely black. Amongst some Ichneumons, which Mr. Fitch kindly sent me to look over, I detected two of Holmgren's species of *Limneria*, whilst in my collection I found a third. The three together leave no doubt in my mind as to their identity: they are very similar in shape and colour, but differ from each other as follows :—all have the hinder femora black, and are about from one and a half to two lines long, and have a black abdomen.

A. Hind tibiæ whitish, base and apex blackish.
1. Aculeus about as long as the first segment of the abdomen.
   L. lugubrina, Holm. Bred by Mr. Bignell.
2. Aculeus about half the length of the abdomen.
   L. cursitans, Holm.

B. Hind tibiæ whitish, apex and before the base blackish.
   Aculeus as long as *L. cursitans*, and antennæ shorter.
   L. volubilis, Holm. Bred by Mr. Weston.

These are all new to the British list. I have also taken *Phygadeuon aberrans*, Tasch., which is like *P. abdominator*, with a punctured abdomen; also a small species of the same genus, which I believe to be *P. nanus*, Grav.

The two following species of *Phygadeuon* I cannot find described in Taschenberg or Gravenhorst :—

P. Black; 2–5 joints of antennæ, abdomen from the 1st segment, femora, tibiæ, and tarsi red; extreme base and apex of hind tibiæ and hind tarsi dark; mesothorax coarsely punctured in the middle; metathorax shining, coarsely wrinkled; areæ very distinct; supero-medial, hexagonal much narrower in front than behind; 1st segment of the abdomen elongated; tubercles projecting and placed much behind the middle; from them it gradually widens, and is coarsely and distinctly long-wrinkled; remaining segments polished, 2nd very indistinctly long-wrinkled; abdomen elongate-ovate; transverse anal nervure divided less than one-third from the bottom; 1st joint of the flagellum about three times as long as thick; aculeus about one-sixth the length of the abdomen. Female. Length, 6·5 mill. Taken August 4th. Norwich.

The other species was sent to me by Mr. C. G. Barrett from Pembroke.

P. Black; abdomen from the 1st segment and legs chestnut;

base of coxæ, extreme base and apex of hind tibiæ and hind tarsi brownish; mesothorax punctured; metathorax punctured, and areæ distinct; supero-medial area almost semicircular; 1st and 2nd segments of the abdomen strongly and distinctly longitudinally striated; 1st segment slender, gradually tapering, with a slight depression in the centre, and tubercles scarcely projecting; transverse anal nervure divided much below the middle; aculeus about one-fourth the length of the abdomen. Female. Length, 5 mill.

I have met with several specimens of *Tryphon ephippium*, Holmgren. This species is readily distinguished by its smooth and shining metathorax, and is unrecorded by Mr. Marshall.

Mr. Fitch sent me, for examination, an *Ophion* with a yellow scutellum, which he thought different from *O. obscurum*. I was doubtful, but on its being sent to Dr. Kriechbaumer he identified it as certainly his *Ophion minutus* (described Ent. Nach., v. 105). It is, therefore, a species new to the British list; the specimen, a female, was captured by and received from Mr. Bignell. The neuration in Vollenhoven's figure ('Pinacographia,' pl. 39, fig. 1), is not correct.

Amongst my *Polyblasti* I detected three specimens of Holmgren's *Monoblastus lævigatus*. This genus is divided from *Polyblastus* by not having the clypeus separated from the face by an impressed line.

The pretty little *Perilissus pictilis*, Holm., figured in 'Pinacographia,' I have taken in this neighbourhood; also a small species which I cannot find in either Gravenhorst or Holmgren, and have, therefore, added the description:—

Black; abdomen from the 1st segment, legs, and antennæ beneath reddish ochre colour; apex of abdomen and 2nd segment sometimes clouded; coxæ, apex of hind tibiæ and tarsi brown; wings blackish brown and very dark; abdomen and face densely clothed with pale fulvous pubescence; antennæ about as long as the body; 1st segment subpetiolated; thorax smooth and shining; metathorax without area; areolet of wing oval and petiolated. Length about 5 mill.

This species has the wings unusually dark, and for that reason I would propose the name of *Perilissus fumatus* for it, should it be a new species.

Amongst some Ichneumons collected by Mr. Billups was a specimen of *Pimpla* I could not identify as belonging to any recorded British species. It appeared to me to answer best to Gravenhorst's *P. mandibularis*. Mr. Fitch has sent it to Dr. Kriechbaumer, who does not agree with this determination, but was not able to name it. It was then sent with some other Ichneumons, by Kriechbaumer's advice, to Herr C. G. A. Brischke, who says it most probably is *P. mandibularis*, and so for the present it must remain.

I bred from the cocoons of *Apanteles glomeratus* both sexes of *Hemiteles imbecillus*, Gr., by whom the male only is described, nor does Taschenberg describe the other sex. To their descriptions it only wants to be added "Aculeus of female half the length of the abdomen." I have a fine specimen of *Herpestomus* which I cannot find described:—2–4 segments of abdomen entirely red, remainder red-margined; antennæ reddish brown; flagellum paler at the base; legs red; apical half of hind femora and extreme apex of hind tibiæ dark; 1st segment of abdomen strongly and distinctly longitudinally striated. Length, 6 mill. Female. Taken in this neighbourhood.

I frequently take a *Pimpla*, which I believe is *P. detrita* of Holmgren; it is very distinct from any hitherto recorded British species. I have sent it to Dr. Capron; he thinks there is no doubt about the identification, and adds that he takes it commonly at Shere.

Norwich, December, 1879.

NOTES ON THE RHOPALOCERA OF NATAL.

By A. J. Spiller.

(Continued from p. 5.)

The genus *Junonia* is generally numerous in most tropical and subtropical countries of the Old World, and in Natal is represented by eleven or twelve species. The loveliest is the magnificent *Junonia Anacardii*, or mother-of-pearl butterfly. It is indeed a fine sight to see half a dozen of these splendid insects, in company with an equal number of *J. Archesia*, settled on the sausage-shaped flowers of the cabbage tree. The commonest species of this genus are *Œnone* and *Clelia*, which are found everywhere in profusion. *J. Cloantha*, which inhabits meadows, is almost equally abundant; this latter is orange-ochreous with purple reflections, and has on the hind wings a row of blue ocelli. *J. Ceryne* is not unlike our *V. urticæ;* it is scarcer than the foregoing. I have taken a *Junonia* which is, I think, a variety of this, but the fore wings are rounded instead of angulated, and it possesses a common median transverse white band. *J. Natalica* inhabits woods, settling on the outer leaves of shrubs, and is not very common. *J. Amestris*, a fine black and blue species with a flight resembling the larger English *Vanessidæ*, occurs most frequently in rough hilly districts. I have found stone-quarries abounding with loose stones the best places for them; they rest during the winter evenings underneath the stones, and by day they may be detected flying in the neighbourhood. On one occasion I remember thrusting my collecting-stick into a hole in a stone-quarry for the purpose of routing out any snake that might have taken refuge there, when out issued quite a number of *J. Amestris.* A quick stroke of the net secured four, but some half a dozen others must have escaped. *J. Pelasgis* and *J. Pelarga*, I think, are scarce; I have taken both species, but the latter species only twice.

Myscelia Natalensis is a dark brown insect that seems particularly fond of settling with closed wings against the rough bark of trees. The cabbage tree is particularly favoured, and last April I noticed it by hundreds in such situations. A stroke against the trunk of the tree sent them flying in a perfect cloud.

Neptis Melicerta, a long narrow-winged black and white species, does not seem plentiful, since I have only once taken it, and, strange to say, it was in my own garden.

Diadema Misippus has already been referred to; it is tolerably common. Another of the same genus (*D. Dubia*), is scarcer. It has a lofty flight in woods.

Eight species of the genus *Nymphalis* have been recorded from Natal, to which must be added a large ochreous species taken at the Inanda by myself and Mr. Wood. This fine genus possesses many of the peculiarities of *Apatura*, being distinguished by a lofty rapid flight and a continual settling on trees and shrubs. *Nymphalis Xiphares* I have never had the pleasure of taking, but I have seen it on three occasions; one seen in January (1879) I should most probably have taken had it not in its flight led me from the wood into the high road into the midst of some five hundred Kaffirs who were hastening to the Zulu war. Modesty prevented me favouring the "noble savage" with a specimen of the entomologist's art. *N. Xiphares* is a fine black insect with violet suffusions. *N. Ethalion* is a black species which, after a short but extremely rapid flight, settles on the edge of shrubs a dozen feet from the ground. By cautiously waiting, and then striking rapidly, I have managed to take a small series of this insect. *N. Brutus* is another rapid flyer that it is waste of time to chase; it expands nearly four inches, and its body is remarkably robust, whilst its wings are strong and firm; thus it is peculiarly fitted for a rapid flight. Here I find the twenty-feet pole handy, and by this means have taken several. *N. Zoolina*, a white *Nymphalis* with dark brown markings, I have captured several times settled on the leaves of the mimosa tree. *N. Neanthes* has the habits of *N. Ethalion;* on August 15th, 1879, however, I took a female resting on the ground. This latter insect is reddish ochreous in colour, with developed tails.

Philognoma Varanes is allied to *Nymphalis;* it is a common insect, but owing to its great size and strength of wing is a most awkward "customer" to catch.

Cyllo Leda and *Gnophodes Parmeno* are not uncommon; the former flies by night, and comes to sugar like a *Noctua.* At the Inanda Hill, as previously mentioned, I captured a new *Debis.* The recorded species, *Dendrophilus*, I have never taken.

Yphthima Hebe, an insect like *Epinephile Tithonus* in habits and shape, is a feeble flyer, haunting dark corners of woods. It is however, very local, since I have only taken it in one locality of limited extent. *Mycalesis Evenus* and *Narcissus* are butterflies of the Ringlet pattern and habits; their mode of flight is an exact imitation of *E. Hyperanthus.* Like *Y. Hebe*, they haunt dark corners and are not common. They appear generally in March and April, and *M. Evenus* especially has beautifully ocellate spots on the under side. Both species reappear very sparingly indeed in August, but then, in all the specimens I have taken, I notice the under side plain without the "ringlets."

Eurytela Hiarbas is a very common butterfly in woods, flying after the fashion of *L. Sibylla;* another species, *E. Dryope*, with a yellow band, is scarcer. *Hypanis Ilithyia* is a most abundant butterfly, and appears in several forms, according, I presume, to the degree of temperature prevailing. In summer the under side is very light brown, in winter very dark umber-brown; in April and August the under side is intermediate in colour between these two extreme forms. The summer and winter forms of many of our butterflies are very different; the winter form of *Pieris Gidica* is especially interesting. Many of these forms have been dignified as species by closet entomologists.

The genus *Loxura* commences the *Lycænidæ*. *Loxura Alcides*, a stout swift butterfly with long tails, is of the most intense metallic-blue; the under side is of a chesnut-brown. Gardens are a favourite resort of this species, and the brilliant effect of its deep blue hue as it hovers over a flower may be imagined. Its flight is rapid, its wings apparently folded, and its long tail protrudes. *L. Dermaptera* I met with once in the public park at Durban; it is much more dusky in hue than its congener.

Myrina Pallene is a species allied to *Loxura*, and has a habit of resting on the leaves of trees, from whence it may be taken by the net.

Iolaus Silas and *Sidus* are two exceedingly beautiful blue butterflies, ornamented with tails, *Sidus* especially being of a brilliant metallic-blue, almost as bright as *Loxura Alcides*. Both species appear generally distributed, *Silas* being apparently the more frequently met with. A favourite situation for *Sidus* is the bright orange flowers of a hedgerow plant called by colonists the "thick," and I have also taken it from the low boughs of trees. The female is far duller in tint than the male. The under side is white, with red "hair-streaks."

(To be continued.)

THE TORTRICES OF SURREY, KENT, AND SUSSEX.

By Walter P. Weston.

(Continued from p. 37.)

Sericoris euphorbiana, Zell.—Local, but not uncommon where it occurs. The larva is to be found in August and September feeding in the shoots of sea spurge (*Euphorbia paralias*), which it draws together: as soon as it is full fed it leaves the food-plant, and wanders away to pupate. The moth is to be met with in the following May, but is not nearly so common as in the earlier stage. It occurs at Folkestone.

S. abscisana, Guen. =*fuligana*, Haw.—Another local species. The imago occurs in July and August, flying at dusk among common fleabane (*Inula dysenterica*), upon which the larva feeds, and should be sought for in May and June. Folkestone is the only locality where I have taken this species.

S. bifasciana, Haw.—Is to be met with in July and August flying at dusk round Scotch fir (*Pinus sylvestris*), and appears to be more widely distributed than either of the preceding species. It has occurred in Surrey, at West Wickham, Weybridge, and Mickleham; in Kent, at Darenth; and is included by Mr. C. G. Barrett in the list of species at Haslemere.

S. littoralis, Curt.—A very variable species as regards colour, but easily distinguished by its long narrow wings. It occurs along the sea-coast, banks of rivers, &c., among sea thrift (*Statice armeria*), and may be taken plentifully in June and July at dusk, flying with a short jerky flight. It has been bred by my friend Mr. Howard Vaughan, and others, from this plant. It occurs in Kent, along the banks of the Thames below Gravesend, and at Hythe; in Sussex it has been taken at Pett, near Hastings.

S. cespitana, Hub.—A very bright coloured but variable species, and generally abundant on chalk downs in July and August. The localities are Caterham, Mickleham, Darenth, Sevenoaks, Dover, Folkestone, &c.

S. conchana, Hub.—Rather local, frequenting damp places on heaths, broken ground, and open rides in woods. The imago is to be met with in July, and flies freely in the hot sunshine as well as at dusk. It has been taken at Darenth, near Strood, Tunbridge Wells, Folkestone, Mickleham, Tilgate Forest, &c.

S. lacunana, Dup.—Common everywhere. In some localities this species is liable to much variation, some examples being dark cinereous, or smoky black; others coal-black, with markings indicated by lustrous leaden hues. Mr. C. G. Barrett, in his Notes on British Tortrices (E. M. M., vol. xi., p. 28 *et seq.*), writes: "I have reared these dark varieties along with the typical form from screwed-up leaves of meadow-sweet (*Spiræa ulmaria*). They have been erroneously placed in some collections under the name of *herbana*." Mr. Barrett then gives his reasons why *S. herbana*, Gn., should be considered as a variety of this insect rather than a separate species; with which I think all who have met with *herbana* entirely concur.

S. urticana, Hub.—Common everywhere.

Roxana arcuana, Linn.—Not uncommon among oak bushes in May and June. It flies freely in the sunshine, and is widely distributed throughout these counties.

Euchromia purpurana, Haw.—Distributed but not common. The imago should be looked for towards the end of June and July among mixed herbage, on rough and broken ground.

Orthotænia antiquana, Hub.—Widely distributed, but not a common insect. The imago appears in June and July, and is to be found in similar situations to *E. purpurana*. In the E. M. M., vol. xv., p. 148, my friend, Mr. C. G. Barrett gives a most interesting account of rearing this species from the roots of the corn woundwort (*Stachys arvensis*), which he had collected in February.

O. ericetana, Bntl.—Distributed, and is to be met with in similar situations to *E. purpurana*, and occasionally in company with that insect, but it is not common.

O. striana, W. V.—Equally distributed as the preceding, but much commoner. The imago appears from the end of May to the end of June, and is usually met with at dusk flying slowly and for a short distance. The females are more often to be found at rest, with the aid of a lantern.

Eriopsela fractifasciana, Haw.—This species occurs commonly upon the chalk, and is double-brooded. The imagos of the first brood appear about the middle of April; while the second brood, which is more plentiful, occurs in August and September. It is widely distributed, and may be met with in all suitable localities throughout these counties. It flies freely at dusk.

E. quadrana, Hub.—In similar situations to the preceding species, but somewhat later in the time of its appearance. It is to be taken on the wing at dusk, and is single-brooded. Its capture has been recorded from West Wickham and Darenth Wood, and has also been taken at Dover, Folkestone, Mickleham, Box Hill, and Lewes.

Phtheocroa rugosana, Hub.—Widely distributed, but not a common insect. It flies at dusk in May and June along hedges where the red-berried bryony (*Bryonia dioica*) occurs, and it would probably answer to search with a lantern for this insect at rest upon the leaves of this plant, in the berries of which the larva feeds.

Cnephasia cinctana, W. V.—This lovely little species is at present confined to Kent. It was first discovered by the Rev. S. C. Tress Beale in 1857, and was figured and described in the 'Annual' for the following year. After a lapse of several years it was again met with in plenty in the same county in 1878 and last year. The imago appears in July, but the earlier stages have not yet been discovered, so far as I am aware.

C. politana, Haw.= *lepidana*, Curt.—Not uncommon on moors and heathy places. The imago occurs from the end of April to June, and is on the wing during the afternoon sunshine. The larva feeds on sweet gale (*Myrica gale*), but is probably not confined to this plant. It occurs at Croydon, Weybridge, Tilgate Forest, near Tunbridge Wells, Uckfield, and Brighton.

C. musculana, Hub.—Abundant in all woods and country lanes in May and June. The imago flies at dusk, and is very strong on the wing; it also comes to sugar. The larva feeds on various trees, and also low plants.

(To be continued.)

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Diurni in Ireland.—I think it may interest some of your readers to know that on the 3rd of October this year, in a wood near Carlow, Ireland, I saw a great many *Satyrus Ægeria* in good condition, and also one *Argynnis Aglaia*, apparently only just emerged from its pupa. *Vanessa cardui* was abundant in the vicinity of Dublin towards the end of September, but I saw only one *V. atalanta*.—G. Dewar; 79, Thistle Grove, South Kensington, London, December 14, 1879.

Satyrus Janira.—Referring to Mr. Slater's note in the 'Entomologist' (vol. xii., p. 295) that *Satyrus Janira* was not seen until July 18th, allow me to say that I saw one in a lane near the "Royal Oak," Finchley Road, Middlesex, in the afternoon of May 3rd.—W. T. Hay; 13, Park Road, Haverstock Hill, N.W., January 2, 1880.

Silk-producing and other Exotic Bombyces.—As the rearing of foreign Lepidoptera is gradually becoming more practised in this country, a few remarks on the successful productions of cocoons in the open air may be of interest to those whose efforts in this respect have not been attended with success. *Saturnia pyri*, the large emperor moth, is said not to have been bred in the open air further north than Paris; nevertheless, having previously produced cocoons of this fine insect in a cool room of northern aspect, I determined to try the experiment, and, notwithstanding the past inclement summer, succeeded in obtaining several healthy fair-sized cocoons from larvæ fed on a plum tree (*Prunus domestica*). Great care, however, was necessary in the earlier stages to prevent the young larvæ from becoming a prey to spiders (Arachnidæ), and other predatory insects. *Attacus pernyi*, from Manchooria, a northern division of China, and *Attacus cynthia*, from Northern China and India, I also succeeded in rearing in the open air on oak (*Quercus pedunculata*) and *Ailanthus glandulosa* (tree of heaven) respectively; but as these moths are of a hardier race than *S. pyri*, perhaps similar experiments with them by others have proved equally successful. With regard to *A. pernyi* it may not be irrelevant to state that a very praiseworthy effort was made some years ago by a gentleman residing in Colchester to acclimatise it, to which intent a number of impregnated females were liberated in a neighbouring wood on the north side of the town. The result, however, was not successful, though full-grown larvæ were subsequently beaten out of the oaks in the same wood. Two specimens of the moth, and probably others, appear to have been captured in the town about the time of the experiment, apparently attracted thither by the glare of the gas-lamps. Probably other Bombyces, such as *Attacus Cecropia*, *A. Luna*,—a lovely apple-green swallow-tailed moth of queenly beauty, poetically styled by an American author "fair empress of the night," in fanciful allusion to the name given by the Romans to the moon,—*A. polyphemus*, and *Saturnia Io* could, perhaps, during a warm summer, be likewise bred in the open air were fertile eggs obtained sufficiently early in the season to experiment with. I confess I have not been successful, either in or out of doors, in breeding these moths. *Attacus silene* from India, another splendid exotic Bombyx, much larger, lovelier, and more delicately plumaged than *A. Luna*, its American congener, is undoubtedly more entitled to the poetical designation before alluded to. I succeeded beyond expectation in rearing several magnificent larvæ of this truly grand insect on a walnut tree (*Iriglaus regia*) to the last moult, when a violent storm of wind and rain towards the end of August terminated their existence. This Bombyx is polyvoltine or many-brooded, as observed by Monsieur A. Wailly in his notes on silk-producing Bombyces (Entom. xii. 10), and, therefore, no doubt offers a fairer chance of success to the experimentalist than many other foreign species; so that, under favourable circumstances, its cocoons should be formed early in September in this climate. *Attacus mylitta* from China and India (tussah-worm or moth), which produces a strong and valuable silk largely used for clothing in India, might probably, likewise, be reared in the open air in England, and, in the interest of science, I think the experiment worth attempting. I may mention that I have obtained cocoons of *Aglia tau*, the correlative of *Endromis versicolor*, from larvæ bred in the open air on oak. This insect, which can also be reared on beech (*Fagus sylvatica*) and other trees, is apparently not of difficult culture. From the foregoing remarks it would seem that European and Asiatic Lepidoptera are more easily reared in this changeable climate than those imported from America; such at least is my experience. Perhaps others more versed than I in this interesting and instructive study would, with the editor's permission, record their experience in the 'Entomologist.'—Geo. J. Grapes; 2, Pownall Crescent, Colchester.

Note on the Egg State of Lepidoptera. — In the few books on Lepidoptera which I have consulted, although sometimes long and scientific descriptions are given of the insects when in their perfect state, little information is given on the larvæ, and still less on the state of the insects during the winter. They seldom say if the insect, during the winter, is in the egg, the larva, the pupa, or even the imago state. In the case of some species this is perfectly well known, but of many nothing is said on the subject. Again, when eggs of Lepidoptera are deposited during the autumn, will the larvæ always hatch of those species which are given and considered as passing the winter in the larval state? If these eggs be deposited too late in the autumn, or the weather be too cold, will not the hatching of these eggs (which in ordinary and mild weather would take place during the autumn), be delayed till the spring? I cannot answer this question in a general way through want of experience, but I can state a fact which may help towards the solution of the question. A few years ago I received from France, in the mouth of May, a quantity of larvæ of *Bombyx trifolii*. In due time I obtained the cocoons, the moths, the pairings, and a large quantity of fertile eggs. These, instead of hatching during the autumn, only hatched at the end of February, the larvæ having remained in the egg fully developed and in good condition during several months. I opened, during the winter, the *Trifolii* eggs, as I had previously done the *Yama-Maï's*, to see the living larva in the egg. *B. trifolii*, however, like *B. quercus* and other species, is one of those given as hybernating in the larval state. As a matter of fact my *B. trifolii* were larvæ during the winter, but they were in and not out of the egg. Now, can this be called an accident, and is it not possible that eggs of other species, which generally hatch in the autumn in favourable weather, may be naturally retarded by cold till the following spring, or even longer, the larva remaining all the time fully developed in the egg?—ALFRED WAILLY; 110, Clapham Road, S.W.

EARLY NOCTUA.—On February 4th an imago of *Noctua plecta* emerged from a pupa dug at Oxford last November. The pupæ were in a cold room with north aspect.—J. WYAN THOMAS; 19, Cornwall Gardens, Queen's Gate, S.W., February 4, 1880.

EARLY MOTHS.—I was exceedingly surprised upon looking into one of my breeding-cages to find that a specimen of *Biston hirtaria*, as also one of *Orthosia lota*, had emerged from the pupæ. Is not this rather an unusual occurrence, and is the fact worth mentioning in the next issue of 'The Entomologist'? Perhaps some of your readers might account for the phenomenon.—EDMUND SHUTTLEWORTH; 59, Charlotte Street, Portland Place, W., February 14, 1880.

EUCHELIA JACOBEÆ IN AUGUST.—While in Surrey last year, on August 4th, I captured three imagos of *E. jacobeæ*, one of which was very fresh and seemed but recently to have emerged, and at the same time a number of larvæ of the same moth, some of which were nearly full grown. Were not the imagos very late?—P. F. ALEXANDER; Lower Heath, Hampstead, N.W.

NOTES ON THE PAST SEASON FROM WORCESTERSHIRE.—My first capture of any importance was a *Dasycampa rubiginea*, which I beat from sallow on April 1st in fair condition. During the first fortnight of the same month I took *Tæniocampa rubricosa*, *T. gracilis*, *T. populeti*, *T. leucographa*, and *T. opima*, but only a few of each; I believe the latter insect has not been before recorded from Worcestershire. I may mention that Mr. Edwards, of Malvern, has also taken it this season. Towards the end of the month and at the beginning of May *Cidaria suffumata* and *Anticlea derivata* were more than usually abundant. I was much surprised on the 2nd of May to find a *Chesias obliquaria* out in the breeding-cage; I have never had it out before until the end of the month. During the second week in June *Thanaos Tages*, *Syricthus alveolus*, *Euclidia glyphica*, *E. Mi*, and *Ephyra omicronaria* were swarming. On the 25th I captured *Leucophasia sinapis*, *Melitæa Artemis*, *Epione advenaria*, *Selenia lunaria*, *Asthena Blomeraria*, and *Procris Geryon*, all in good condition, and all very scarce, with the exception of *M. Artemis*. Mr. Edwards and I managed, however, to fill our boxes with *Minoa euphorbiata* and *E. omicronaria*, which flew from every bush. On the 30th of June I made an expedition after *Lycæna Arion*, meeting with eight; this is about a week earlier, I think, than the first recorded capture by a former correspondent this season. On the same day I found *Ephyra trilinearia* very common, but mostly worn. *Lycæna Argiolus* and *Thecla rubi* were also about, but in bad condition. *Platypteryx unguicula* completed my day's work. After the 11th of July *Timandra amataria* and *Cidaria dotata* were more than usually common, and towards the end of the month the same remark applies to *Cidaria pyraliata* and *Hemithea thymiaria;* on the other hand *Asthena sylvata*, *Nemoria viridata*, and *Acidalia imitaria*, never turned up at all. *Ligdia adustata* was common from May till the middle of August. As regards the Noctuæ the following, common in 1878, were almost, or entirely, absent:—*Cosmia diffinis*, *C. affinis*, *Agrotis saucia*, *A. suffusa*, *Noctua C-nigrum*, *Mania typica*, *Catocala nupta*, *Amphipyra tragopogonis*, &c. With the exception of *Mania maura* I found no Noctuæ plentiful. As an instance of the lateness of the season, I may state that on July 28th *T. Tages* and *Argynnis Euphrosyne* were still flying, *Satyrus Hyperanthus* was first out, and at the same time I captured a fresh specimen of *A. Blomeraria;* and on December 6th *Hybernia defoliaria* were still coming out in the breeding-cages.—[Rev.] E. C. DOBREE FOX; The Parsonage, Castle Morton, Worcestershire, December, 1879.

CAPTURES AT PLUMSTEAD, &c.—During the winter I searched for stems of *Stachys sylvatica* for larvæ of *Ephippiphora nigricostana*, and succeeded in finding about a dozen, which emerged in June last. At the end of May, among other larvæ, I met with *Geometra papilionaria* and *Phycis betulella* in the wood, and, on the wing. *Macaria notata*, *Eupœcilia nana*, commonly; *Argyresthia conjugella*, plentifully; and a few specimens of *Œcophora subochreella* and *Æchmia dentella.* I also reared from larvæ found in this neighbourhood during the previous autumn a fine series of the pretty *Gelechia scriptella* from maple leaves; *Ornix betulævorella*, which was scarce, and *Lithocolletis ulmifoliella* in plenty from birch leaves. *L. corylella* was common, and *L. nicelliella* scarce from hazel leaves; *L. acerifoliella* in profusion from maple leaves; *L. schreberella* common from elm; *Antispila Treitschkiella* from dogwood: and eight of the rare *Coleophora fuscocuprella* from hazel.—William Machin; 22, Argyle Road, Carlton Square, London, E.

Trifurcula atrifrontella bred.—In June last an insect emerged from one of my breeding jars which I did not know, and it unfortunately had so battered itself that recognition was difficult. Mr. Stainton, however, says that it is *Trifurcula atrifrontella;* and as nothing was in the jar except hawthorn leaves collected the previous autumn for larvæ of *Nepticulæ*, it appears certain that the larvæ of *T. atrifrontella* were feeding in the hawthorn at the same time. I remember noticing two or three blotch mines which then appeared distinct from *Nepticula perpygmæella* or *N. ignobilella*, but their number was so few that I thought it best to leave them with the others. The larvæ were collected in October, and it is likely that had they been looked for in the previous month more of the larvæ of *T. atrifrontella* would have been found. The time of emergence does not agree with that given in Stainton's 'Manual.'—J. H. Threlfall; Preston, February 8, 1880.

Numerical Relations of the Sexes among Lepidoptera.—There has been some amount of discussion on the relative preponderance in number of the two sexes among moths and butterflies. The trade catalogue of European Macro-Lepidoptera, issued by Herr A. Kricheldorff, of Berlin, seems to throw some light upon this question. In no fewer than 177 cases the female is charged at a higher price than the male, whilst in only eight cases is the male the dearer. This surely proves that in a large majority of the cases where a notable sexual difference appears the female is, practically speaking, the rarer.—J. W. Slater; 18, Wray Crescent, Tollington Park, N., January 21, 1880.

INSECTS AND THEIR FOOD-PLANTS.—It is singular with what instinct insects find out certain plants and shrubs not common in cultivation to feed on. I have, in my garden at Wotton-under-Edge, a find old shrub of *Buddlea globosa.* This, when its beautiful globular orange-coloured blossoms are well out, is deliciously sweet with a strong honey-like perfume, and consequently very attractive to a great variety of insects both by day and night—Lepidoptera, Coleoptera, Hymenoptera, and Diptera in more or less abundance; and many an hour have I spent catching insects at it. Among the Coleoptera which were so attracted was the little *Cionus scrophulariæ;* it was always to be found diving its beak into the very centre of the flowers. Little did I dream how a little later on the young shoots and suckers, which spring abundantly round the old stock, would be so dreadfully disfigured by this insect, but there it was in the larva state in abundance. I had to make use of the knife very extensively to get rid of the pest and keep the shrub in a decent state. I believe this is the only shrub of the kind in the town, and being so centrally situate, and far removed from any pond or brook, it is certainly a marvel how the insect could have found it out in so different a situation to its usual habitat. The *Buddlea* is an American shrub belonging to the natural order Scrophulariaceæ, which includes the figworts of our pond banks, the ordinary food of this insect.—V. R. PERKINS; 54, Gloucester Street, S.W., December, 1879.

HYMENOPTEROUS PARASITES OF LEPIDOPTERA.—The following meagre list of parasites on various Lepidoptera is composed from materials which have lately passed through my hands. Its publication will be useful for future reference. The parasites were bred by the gentlemen whose names are attached, mostly in 1879. In many instances I am indebted either to Mr. Bridgman or Dr. Capron for the identification of the Ichneumons:—

Chasmodes motatorius, F., from *Nonagria geminipuncta* (W. P. Weston).
Ichneumon bilineatus, Gmel., from *Bryophila glandifera* (G. C. Bignell).
I. lineator, F., from *Nonagria geminipuncta* (Weston).
I. trilineatus, Gmel., from *Abraxas grossulariata* (C. G. Barrett).
Amblyteles Proteus, Chr., from *Chærocampa Elpenor* (Bignell).
Trogus lutorius, F., from *Smerinthus ocellatus* (E. A. F.), *S. populi* (E. A. F.), and *Sphinx ligustri* (Bignell).
Phæogenes stimulator, Gr., from *Yponomeuta padella* (E. A. Butler).

Cryptus migrator, F., from *Bombyx quercus* (E. A. F.).

C. tricolor, Gr., from *Simyra venosa* (T. Eedle).

Mesostenus obnoxius, Gr., from *Zygæna filipendulæ* (Bignell and Weston).

Hemiteles similis, Gr., from *Lithocolletis spinicolella* (T. R. Billups).

Agrothereutes Hopei, Gr., from *Coleophora solitariella* (G. C. Champion).

Ophion obscurus, F., from *Dicranura vinula* (Eedle).

Anomalon xanthopus, Schr., from *Trachea piniperda* (J. B. Bridgman), and *Pieris Daplidice* (Bignell); pupa from Baklar, Turkey.

A. fibulator, Gr., from *Zygæna filipendulæ* (Weston).

Paniscus testaceus, Gr., from *Dicranura vinula* (R. M. Sotheby and E. A. F.).

P. cephalotes, Holmgr., from *Dicranura vinula* (Eedle and Bridgman).

Campoplex pugillator, L., from *Notodonta ziczac* (E. A. F.).

Limneria albida, Gmel., from *Gonepteryx rhamni* (Bignell).

L. lugubrina, Holmgr., from *Œcophora flavimaculella* (Bignell).

L. transfuga, Gr., from *Scythropia cratægella* (E. A. F.); cocoons from W. Machin.

Cremastus sp.? from *Coleophora solitariella* (Champion).

Mesoleptus testaceus, F., from *Simyra venosa* (Eedle).

Eclytus ornatus, Holmgr., from *Tortrix heparana* (Bignell).

Pimpla instigator, F., from *Liparis salicis* (E. A. F.).

P. ruficollis, Gr., from *Retinia turionana* (Barrett).

P. diluta, Ratz., from *Pyrameis cardui* (Barrett).

P. graminellæ, Schr., from *Odonestis potatoria* (E. A. F.).

P. brevicornis, Gr., from *Eupithecia linariata* (Bignell).

Glypta bifoveolata, Gr., from *Dicrorampha simpliciana* (Weston).

Apanteles sp.? from *Vanessa Atalanta* (Bignell).

A. sp.? from *Satyrus Hyperanthus* (Butler).

A. sp.? from *Zygæna filipendulæ* (Bignell).

A. sp.? from *Chelonia plantaginis* (Bignell).

A. sp.? from *Abraxas grossulariata* (Bignell).

A. sp.? from *? Catocala nupta* (Butler).

A. sp.? from *Lithocolletis lantanella* (Billups).

Microplitis ingrata, Hal.? from *Smerinthus ocellatus* (B. Brown).

Microgaster annulipes, Curt.? from *Euchelia Jacobeæ* (Butler).

Peristenus sp.? from *Anarta Myrtilli* (Butler).

Macrocentrus linearis, Ns., from *Botys verticalis* (Bignell).

M. linearis, Ns., var. *pallipes*, Ns., from *Arctia caja* (Weston).

Pteromalus sp.? from *Saturnia carpini* (E. A. F.)

Copidosoma truncatellum, Dalm., from *Eupithecia absynthiata* (E. A. F.).

Entedon sp.? from *Lithocolletis pomifoliella* (Billups).

E. sp.? from *Lithocolletis faginella* (Billups).

Elachestus rufescens, Spin., from *Nepticula aurella* (Billups).

Eulophus sp.? from *Nepticula aurella* (Billups).

E. sp.? from *Lithocolletis pomifoliella* (Billups).

Several other bred specimens have been received, but either their determination is doubtful or the true host is uncertain; especially is this the case with certain Noctuæ.—EDWARD A. FITCH.

ZYGÆNA FILIPENDULÆ AND ITS PARASITES.—Mr. Fitch, in his note in the January number of the 'Entomologist,' under the head of "*Mesostenus obnoxius*," remarks that Rogenhofer had bred *Cryptus fumipennis*, Gr., from *Z. læta* (Entom. xii. 18). Two years ago we brought a number of cocoons of *Z. filipendulæ* from Wotton-under-Edge, and very shortly after most of the moths emerged; the cocoons, however, were left in the case untouched, when last season there appeared in the case eight specimens of *Cryptus fumipennis*, five males and three females. These parasites had remained in the pupa just twelve months. They were identified by Dr. Capron. Happy thought! never throw away unhatched, though old, cocoons.—V. R. PERKINS; 54, Gloucester Street, S.W., January 15, 1880.

SPIDERS IN 1879.—At page 289 of the 'Entomologist' (vol. xii.) Mr. Fitch quotes a few words from a paper by myself (Zool. 1861, p. 7553), relative to the effects of the wet season of 1860 upon spiders. The results of my observations during the past season (1879) fully bear out the opinion then offered, that excessive moisture is less hurtful to spiders than to insects in general. I should, however, like to add now a small qualification of that opinion, to this effect, that excessive moisture, combined with an unusually low temperature and absence of sunshine, is exceedingly hurtful to many spiders, but chiefly so to those whose life is passed among the coarser kinds of herbage, plants, bushes, and trees. Such spiders, embracing the *Epëirides*, *Theridiides* (genera *Linyphia* and *Theridion*), together with a large proportion of the *Thomisides*, *Lycosides*, and *Salticides*, have been as a rule very scarce during the whole past season. I have (on the contrary) found most of the species whose existence is passed among damp moss, at the roots of grass, rushes, and *débris* of all kinds, quite as plentiful as usual, even if not more so. These damp-loving spiders (principally of the genera *Neriëne* and *Walckenäeria*) are, in general, exceedingly scarce after a dry, hot summer, when mosses and other short herbage, together with the whole surface of the soil, are parched and often completely roasted up. Most of the *Epëirides* have not only been very scarce during the past season, but many have been almost starved from lack of insect food and want of sunshine, so that they have not attained anything like the dimensions reached in more genial seasons. In September, 1878, the beautiful *Epëira quadrata*, Clerck, was not only in profusion on our heaths, but many of the adult females measured eight, nine, and even ten lines in length. On the same spots during the past autumn this spider was comparatively scarce, and the largest adult female (out of many which I measured) did not exceed four lines, while some scarcely reached three lines in length. *Epëira adianta*, C. L. Koch (perhaps the handsomest of all our indigenous species), was, in respect to abundance, the only exception among the spiders of this family; instead of being scarcer than usual, this lovely (and usually scarce) spider was more abundant than I have ever before noticed it. The specimens were quite as large as usual, and not much later in coming to the adult state than in ordinary years. I cannot give any reason for this exception, more especially as the localities in which *Epëira adianta* occurs are about the most exposed parts of our heath district, and apparently little calculated to give any extra shelter or food in an unusually cold and tempestuous season.—[Rev.] O. P. Cambridge, Bloxworth, December, 30, 1879.

Natural Insect Traps.—I can corroborate the Rev. O. P. Cambridge's statement respecting moths being found quite dead on the blooms of burdock. I have seen *Lithosia complanula* and and *L. griseola* so more than once, and on two occasions have proceeded to box dead specimens of *Eremobia ochroleuca* from these heads; this was excusable, as this pretty moth is so frequently found resting by day on the blooms of *Centaurea nigra*. The causes of this singular mortality I had not traced. Burdock can scarcely be called an insectivorous plant, but Dr. Darwin's work on this subject merits greater attention than it has yet received from working entomologists. The why and the wherefore of these phenomena should be further enquired into. I was much interested in Messrs. Corbin and Druce's remarks on this subject (Entom. xi. 197, 233); this is now revived by Mr. Cambridge's note. These records are most interesting and suggestive, but my present communication leads in rather a different direction. I wish to call collectors' attention to certain natural insect traps occurring in the vegetable kingdom. The insects caught by the sundews and other "catchflies" are mostly useless for cabinet specimens; not so the various Neuroptera, Hymenoptera, and Diptera, which are found drowned in the water which invariably collects in the basons formed by the connate leaves of teasel (*Dipsacus sylvestris*). Several genera of *Trichoptera* and *Tenthredinidæ*, especially *Dolerus*, are mostly well represented. It is by no means difficult to make these teasel insects into good cabinet specimens, either pinned or carded. Another trap, which seldom fails to yield a catch, is the flower-heads of various Compositæ. Amongst the closely laid florets of these flowers certain interesting Hymenoptera, especially *Proctotrupidæ* and *Chalcididæ*, and Coleoptera are frequently to be taken in abundance; to say nothing of the numerous Diptera. The gills of certain Fungi, especially the common mushroom and its allies, are sure to yield material to the student of the *Hymenoptera oxyura*, and these are often interspersed with the more minute Ichneumons and Chalcids, together with various Coleoptera and a few special Diptera. These insects are all engaged in the legitimate business of their lives, and are not there merely for shelter. I mention these, mostly overlooked, sources of material to the collector for two reasons. First, they will yield when insects at large are conspicuous by their absence; secondly, the species which commonly occur in these situations are but rarely taken in the usual way. Again, all entomologists are not active; health and habits interfere: all entomologists cannot always be equipped with nets and other paraphernalia for simple collecting; there are many circumstances which often interfere with this. But in the above-mentioned and similar natural traps we often find a true mine of entomological wealth, whose working is always convenient, and ofttimes especially productive. The lepidopterist and coleopterist will think these remarks foreign, but for them there is much yet to be learned in this direction. The coleopterist, we know, finds plenty of winter work among moss and *débris*; but surely when we learn that 900 specimens comprised, in thirty-four genera and forty species, were collected from only eleven examples of one plant, the usual tale from stubble and other hollow stems must appear small. This collection, together with numerous bugs, ants, spiders, &c., which are not specially specified, was made at Nice from the central cavities of eleven plants of *Glaucium luteum*, the end of December, 1876, by M. Peragallo. For the list of species see Bull. Soc. Ent.

Fr., 1877, p. clxxv. The yellow *Glaucium* is not uncommon on our coasts, but this instance is given as only, what should be, a sample of many. Their record would be a gain to others.—Edward A. Fitch; Maldon, Essex.

A Flower attractive to Insects.—No flower seems to me more generally attractive to insects than the so-called African stonecrop. Its odour, though sweetish, is neither very fragrant nor very powerful, and its dull reddish colour does not to our eyes seem particularly striking; yet wherever they grow they seem preferred to all other flowers, not merely by butterflies, moths, and bees, but by many dipterous insects,—J. W. Slater; 18, Wray Crescent, Tollington Park, N., January 21, 1880.

Cerambyx moschatus.—Judging from my own experience I should say that not only do British specimens of *Cerambyx moschatus* vary from continental ones, as Mr. Slater points out (Entom. xii. 21), but that examples from different localities, even in our own country, are often very dissimilar in colour and size. When I lived at Alresford I used to find this beautiful beetle not at all uncommon; in fact I could take numbers any evening during the season by a bait which may be new to many. This was a lump of dough placed on the ground, or on the trees or hedges near an osier bed (*Salix viminalis*), which they frequented. These Alresford specimens were very large, and of a bright green, differing greatly from some examples sent me from Nottingham a short time since, which were of a bronze-green colour, and not a third the size. It is rather strange, seeing that there is no lack of the food-plant of the larvæ, that in this district the beetle seems quite unknown.—Joseph Anderson, jun., Chichester, January 6, 1880.

Monohammus sutor at York.—I have a fine specimen of the rare beetle *Monohammus sutor* taken in a small garden near my house last summer (1879).—W. Simmons; 6, New Walk Terrace, York, January 20, 1880.

The Glow-worm (Entom. xiii. 20).—The larva of this insect very much resembles the imago; it is also luminous, although in a less degree. These larvæ may be seen very late in the autumn, and again in the spring, long before the real glow-worms appear.—George R. Webbsdale; 88, High Street, Barnstaple.

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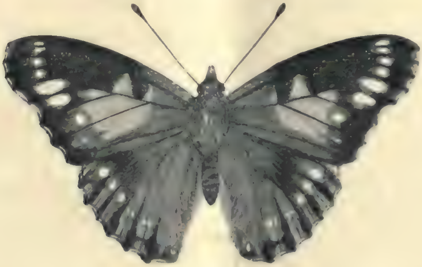
VARIETY OF PYRAMEIS CARDUI.



Pyrameis cardui (variety).

This magnificent variety was bred on September 3rd, 1879, from a larva taken near the locks on the River Lea, at Clapton Park.

The ground colour of the wings is of the normal russet shade, but without the rosy blush on the costa of the fore wings; the whole of the hind margins of the fore wings are suffused with dark umber, almost black, in which the usual row of small white circular spots near the apex and the two costal white spots are replaced by white fusiform blotches, two abnormal white spots also making their appearance near the anal angle; the two large dark spots, which are usually on the disk between the median nervure and the inner margin, are altogether wanting. The hind wings are dark umber towards the base, and rust-coloured between the nervures from the centre of the wings to the hind margin, while between each of the nervures, which form broad streaks of black, are large white spots, forming a row parallel to the hind margin.

The markings are perfectly symmetrical on all the wings. The insect, which is in perfect condition, is a male, rather under the average size. Altogether the variety is one of the choicest I have ever met with in the course of many years entomological experience.

The woodcut at the head of this description has been carefully drawn by Mr. Horace Knight and engraved by Mr. Kirchner.

J. A. Clark.

London Fields, Hackney.

LOCALITIES FOR BEGINNERS.

By John T. Carrington.

No. VI.—SEVENOAKS.

The title of this article should rather have been Seal than Sevenoaks, but as the latter is usually the starting-point for entomologists I think it will be better known. As this treats, however, only of one side of the town, I shall probably, at a future time, return in another sketch to this district.

Sevenoaks is about twenty miles south-east of London, on the direct South Eastern Railway to Dover. Another way is by the London, Chatham and Dover line, but this is five miles longer. The neighbourhood of Sevenoaks peculiarly recommends itself to the entomologist. Surrounded on every side by either woods, commons, parks, or chalk downs, the collector has only to choose between the fauna inhabiting each kind of locality. The geological formation runs in bands of varying width from nearly east to west. Sevenoaks itself is upon the Folkestone Beds, while a couple of miles to the south we are upon the Weald Clay. Just past Seal, another couple of miles to the north of Sevenoaks, we are upon the Gault for a narrow strip; while still continuing north, we cross a very narrow bit of Upper Greensand, between the Gault and the great chalk range of hills beyond. It will thus be seen that the collector has the advantage not only of varied localities for collecting, but varied soils which produce a greater variety of plants than is to be found in most neighbourhoods. With Sevenoaks town we have little to do, in what I am now about to describe, for we leave that town to the right as we pass from the railway station.

The walk I propose to take, in imagination, with my reader, is probably one of the most interesting a naturalist could select in the London district. As we go along I shall point out the best places for the Lepidopterist to work at his leisure; for he could scarcely do more in one day than saunter through the walk without spending much time in filling his boxes with the treasures to be found. Again, I would remind my reader that he cannot take all the species I may mention at one time, for many appear at intervals wide apart. He must, however, try to remember when they are due, and having once seen the locality I think he will be only too glad of an excuse to revisit it.

Having arrived at the South Eastern Station in about an hour after leaving London, the visitor will see the Sennocke Hotel; we go to the right of it, passing the stable-gate, and up the hill through a plantation of Scotch fir, larch, and other trees. On each side of the road are close park palings. These should be examined for *Tephrosia crepuscularia* and *Penthina prælongana.* Both of these moths and many others occur at rest upon them. We follow the road until it is crossed by another, and we are opposite the "Bee-hive" coffee tavern, a new institution among some raw-looking new houses. Now turn to the left, and sharp again to the right up a narrow way, past the back of the "Bee-hive." Follow on to the old gas factory, which may be known by two iron retorts put upright in the ground, one on each side of the gate. Now keep down hill to the left, until the "Man of Kent" is reached, when, straight to the right, we pass in a short time through a small swing gate under three tall elms. This puts us on to the path leading through the cottage gardens allotments, and now we can go on without much further fear of being led astray.

As we pass along the path from the cottage gardens we notice the beautiful undulating country studded with woods on each side of us. Unfortunately these are, I believe, closed to the entomologist. Those trees to the right are in Wildernesse Park, where may also be seen the house which is the seat of the Camdens, but now occupied by Sir Charles Mills. Still following the path, we shortly cross the avenue leading to the house; then past a little patch of comfrey in the corner of a field, which is cultivated for cattle food. Here the gate leads into a lane; turning to the left, still we go forward, remembering that

Platypteryx hamula and *P. unguicula* have both been taken flying just here. At the end of this lane we cross the high road from the London, Chatham and Dover Station, leading to Seal. This is the Maidstone and Godstone high road; here there used to be a toll-gate, and the house still stands. Opposite we see a gate and a path leading up the hill. Following this we come to a hedgerow of old maples, ash, and oak. Many nice plants are here, the most common being dog's mercury (*Mercurialis perennis*), that harbinger of coming spring, and one of our earliest flowering plants, always welcome with its strings of little green flowers. *Ephyra omicronaria* may be beaten out, and *Cleora lichenaria* occurs on the lichen-covered tree trunks. On each side of us we now see that characteristic of Kent scenery,—the hop-pole plantation,—too thick to collect in comfortably, but good round the edges. Through the gate at the end of the path we come into a lane and turn to the left.

So far we have not passed any very important collecting place, but now we enter a really happy hunting ground. In this lane a man might spend a whole season, so rich is its fauna and flora. It would be almost less trouble to enumerate what does not, than what does, occur in this lane. *Vanessa Antiopa* has occurred; *V. polychloros* is common, as are all butterflies which are taken in such places. Of Geometers one is puzzled what to name; *Ephyra omicronaria*, *Scotosia undulata*, *Pericallia syringaria*, *Selidosema prunaria*, *Coremia quadrifasciaria*, *Cidaria silaceata*, *Lobophora polycommata*, *Selenia lunaria*, *S. illustraria*, and many others. Amongst the Pyrales, *Pionea stramentalis* is usually common. Tortrices are in abundance, and it is quite the home of Tineina. The sides of this lane are high hedge-banks with a great variety of shrubs and plants growing upon them. Amongst these are dogwood (*Cornus sanguinea*) in plenty, blackthorn (*Prunus communis*), maple (*Acer campestre*), hazel (*Corylus avellana*), various roses, beech, ash, sallows, brambles, privet, wild strawberry, willow-herb (*Epilobium*), on which we should find larvæ of *Cidaria silaceata*, woodrush (*Luzula*), veitches with the larvæ of *Stigmonota perlepidana*, violets, primroses, woundwort (*Stachys sylvatica*), ladies' smock (*Cardamine pratensis*), bedstraws (*Galium*), and many of the *Umbelliferæ*. On the stitchwort (*Stellaria*) are the cases of *Coleophora solitariella*. Here we may work and collect for hours without interruption.

The gipsies are fond of this corner; they are collecting too, but their booty is of another kind: they are after the dogwood, from which they make multitudes of butchers' skewers.

Still working on, we come to the railway bridge. Standing upon it we look to the left and see the Sevenoaks racecourse. This looks a likely place for Pyrales, Tortrices, and Tineina. On the right of the bridge are some nice railway banks, which are especially inviting for the *Eupœciliæ*, &c., on a sunny evening in June. Turning our faces from whence we have come, we see our road winding on and up to the chalk hills opposite, and for these we start. Just past the bridge is a cottage, and a little before reaching it we cross a little stream; here we may drink,—for the water is always good and the stream is never dry,—as we shall probably see none other for a long time. In the hedge bottom, a few yards past, grow a number of plants of hemp agrimony (*Eupatorium cannabinum*). This is not by any means a common plant in the district. On the seed of this plant may be found the larvæ of *Eupithecia coronata.* I used to wonder where this insect fed in districts where there was no clematis until I found this pabulum.

It is about here we enter on the chalk, and may expect the chalk insects; but although it is still a good collecting ground we push on to the hill-side, and for the big chalk-pit we see in the distance. On the way, however, our attention is arrested by the great stalks of flowers of the Canterbury bell (*Campanula latifolia*). In these bells may be found the larvæ of the somewhat rare pug, *Eupithecia campanulata.* At the top of the lane it is crossed by a high road, known I believe as the "Pilgrims' Road," but in olden times more used by smugglers than by pilgrims. Crossing this we see some old yew trees (*Taxus baccata*). From these we should get *Boarmia abietaria* and *Lithosia helveola.* Shortly after this, entering an open place, we find quite an entomologist's paradise. The slopes from the wood above the chalk-pit are covered with chalk-hill plants in profusion: cowslips (*Primula veris*), and these such large ones; wild thyme (*Thymus serpyllum*), marjoram (*Origanum vulgare*), St. John's worts (*Hypericum*), junipers (*Juniperus communis*), stunted blackthorns, viper's bugloss (*Echium vulgare*), orchids, many species; wood spurge (*Euphorbia amygdaloides*), sallows, wood sage (*Teucrium *scorodonia*), and so many others that one would want to well nigh exhaust a Kentish flora to name them all.

In this chalk-pit and on the slopes one may spend many a long and profitable day. Here is quite a home of the blues, *Lycæna Adonis*, *L. Alsus*, *L. Corydon*, being frequently very common, as is also *Arge Galathea*, with four of the skippers (*Hesperiidæ*). *Acontia luctuosa* is often very abundant, with *Euclidia glyphica* and *E. mi*. Many Geometers are here, as also some good Pyrales and knothorns (*Phycidæ*). Many rare Tortrices have been taken here, and Tineæ are in abundance.

By the side of the road leading up to the wood, and also at the foot of the slopes, are fine tall old hedges oovered with great masses of travellers' joy (*Clematis vitalba*). In these hedges grow large quantities of the mealy guelder rose (*Viburnum lantana*), mixed with blackthorn, roses, brambles, and yew trees. Out of these many species of Lepidoptera may be disturbed with the beating-stick ; one of the most common is *Venilia maculata*, amongst the specimens of which good varieties have been taken ; these should again be looked for. I believe most varieties in Lepidoptera are hereditary, and may be found year after year in the same locality. If it be growing dusk we may frequently fill our remaining empty boxes with the very beautiful *Ilithyia carnella*, which is often very common on the slopes.

One gets tired eventually of even such a place as this, with its beautiful views of the country to the south, and must seek refreshment, and try fields afar for other species. We will, therefore, return by the lane again on to the Pilgrim's Road: turning to the left we pass two or three old yew trees; these are quite landmarks. They have been cut into one of the stupid shapes which was the fashion of our forefathers, who are now quoted as having had such strict views of art; but if cutting a naturally handsome tree to resemble some bird or beast was æsthetic, I am glad we are no longer so. Taking our way forward we turn to the right, down the first road we see, and we come to the quaint village of Kemsing, surrounded by hop gardens: here we find the "Bell Inn," and may rest for a time. In the middle of this village are two potent springs: these are said to supply the source of the River Dart, which joins the Thames at Dartford. There is a charm on a hot day in looking at this clear running water; and when we think of old friends who have joined us in such a ramble as we have had to-day, and who are now no more, we are reminded of the words in Tennyson's poem, "The Brook:"—

> "For men may come, and men may go;
> But I go on for ever;"

Leaving Kemsing we make our way to the south for Seal Chart. Again crossing the railway we leave a likely-looking wood to our left, and follow the right-hand road. This brings us to a farmhouse, amidst more hop gardens; by the farmhouse is a guide-post, and we take our way to the left. There are some old elms by the farm wall, and at their feet is a fine bed of ground ivy (*Nepeta glechoma*); on this we should find the cases of *Coleophora albitarsella.* On the roadside, a little further on, are some hollies, where several varieties of *Lycæna argiolus* have been taken.

Seal Chart is a fine fir wood of many acres in extent; perhaps a couple of miles long. To the entomologist it has the charm of being free. The trees are chiefly Scotch fir (*Pinus sylvestris*), buckthorn (*Rhamnus frangula*), oak (*Quercus robur*), birch (*Betula alba*), hollies (*Ilex aquifolium*), junipers (*Juniperus communis*), &c. The undergrowth is of heather (*Calluna vulgaris*), bilberry (*Vaccinium myrtillus*), golden-rod (*Solidago virgaurea*), &c. Just as we come up to the wood from Kemsing are high banks on each side of the road; these should be very carefully examined for the larvæ of *Cucullia asteris* and *C. gnaphalii.* They have been several times found here, as well as in the wood, feeding on the golden-rod. We keep straight on the Ightham Road, which leads us through the wood, until we come to Mr. George Saxby's brick-yard; here we turn sharp round to the right on our road to Seal. If we have a favourable day, with time to spare, we may always make a good bag in the Chart. Of course we get the fir-feeding species, such as *Ellopia fasciaria*, *Trachea piniperda*, *Thera firmata*, and *T. variata*, with several Tortrices and Tineina. From the bilberries we get *Scotosia undulata*, *Coccyx vacciniana*, *Penthina sauciana*, the latter sparingly, &c. Amongst the other moths we are likely to get are *Tephrosia crepuscularia*, *Boarmia consortaria*, *B. roboraria*, *Epione advenaria*, *Hypena crassalis*, usually common; *Stauropus fagi*, *Geometra papilionaria*, *Agrotis agathina*, *Noctua neglecta*, *Dipterygia pinastri*, *Cymatophora flavicornis*, *Notodonta dictæa*, *N. dictæoides*, and *N. carmelita;* while *Dicranura* *bicuspis* and *Phoxopteryx siculana* have been taken, both in the Chart and in Wildernesse Park. All these, and many others, inhabit this wood, and should be taken in their respective seasons.

Leaving Mr. Saxby's corner for the village of Seal we come upon a fine old fence; this fence is often a great consolation to the entomologist on a windy day, and should at all times be looked over: it encloses Wildernesse Park, which is not open to the collector. Many good moths have been found upon these palings: we hear of ten *Cymatophora fluctuosa* in one day; *Notodonta chaonia*, *N. dodonæa*, *N. trepida*, *Stauropus fagi*, *Boarmia roboraria*, *B. consortaria*, *Cleora lichenaria*, *Phycis abietella*, *Chrosis Audouinana*, *Carpocapsa grossana*, *Stigmonota puncticostana*, *S. Weirana*, *Coccyx splendidulana*, *Catoptria Juliana*, &c.

In a short time, on going down the road, we come up to Mr. R. White's "Yeoman Inn," in Seal, and I have no doubt we shall only be too glad to avail ourselves of a rest. Another mile's walk and we reach the "Bat-and-Ball" Station of the Chatham and Dover Railway, whence we may return to town; or by the Tub's Hill Station, to which we came.

I think I have sketched the locality for the reader in such a manner that he has but to loiter to be happy. What I have missed or not told him, he will have the pleasure of finding for himself; neither have I treated of the many woods and heaths on the other side of Sevenoaks: that is but a pleasure deferred.

As I said at the commencement, Seal ought to have been the title of this article: it is the natural headquarters for all the places I have described, and within an easy walk of any of them.

I have to thank Mr. Eedle for kindly giving me the value of his experience of some twenty years, during which he has collected over this ground.

Royal Aquarium, Westminster, March, 1880.

NOTES ON THE RHOPALOCERA OF NATAL.

By A. J. Spiller.

(Concluded from p. 58.)

Amblypodia is a genus allied to the European *Thecla*, and is represented by some four species, the largest and handsomest of which is *A. Natalensis,* which I generally take resting on flowers. *A. Erylus* and *Leroma* are two species tolerably common that possess the habits of the English *Theclæ,* as they may be easily shaken from trees and bushes. *A. Hirundo* is a singular species, of a dark ash-grey colour, with long twisted tails to hind wings. It is found hovering over bushes, and has a rapid but jerking flight, its wings during that operation being partially closed and tails protruded.

Of the genus *Lycæna* twenty-four species inhabit South Africa according to Trimen, but the number must be very incomplete, as here, at Verulam, I have taken twenty-one distinct species, some six or eight of which I am quite unable to determine. Talking to a Natal entomologist a few days ago, I asked him why it was the small butterflies were so little known. In reply he told me that owing to the difficulty of getting proper entomological pins many collectors simply ignored the small butterflies. It would indeed be a waste of time to catch, say, the little *L. Lysimon,* measuring about eight lines, and then try to impale it on one of those pins known to entomologists as "pokers." The *Lycænæ* are most abundant in January, February, and March; during winter only some half-dozen species may be met with. The largest of Natal Blues is *L. Celæus,* an insect not unlike *L. Arion* in shape and habits; the colouring of the male is bright violet-blue; of the female there are two types, one being tinged with blue, the other quite brown. *Celæus* is plentiful in January. Some eight or nine species of Blues frequent bushes, more especially in January, and a couple of blows to a tree, with corresponding sweeps of the net, should take at least a dozen specimens. During winter a black *Lycæna,* spotted with white, is met with on bushes locally near Verulam; the species may be new, as it is unknown to all entomologists in Natal with whom I have conversed. Several species of the *Ægon* type, but a little smaller, are found in grassy places; another, almost exactly like *Alsus,* is found sparingly, whilst two or three species, only not much more than half the size of *Alsus,* are found in December and January. *L. Bœtica* is common, but has never, to my knowledge, occurred in swarms. On the wing it resembles *L. Alexis,* and is found principally in the neighbourhood of papilonaceous plants. It is a quick flyer.

Chrysophanus Orus I have once seen flying on a piece of waste land near Verulam. The genus *Zeritis* is allied to *Chrysophanus*, but although twelve species have been recorded from South Africa I have never been fortunate to meet with more than two in Natal. *Z. Chrysaor*, a butterfly of a glittering golden tint, I have taken twice at rest on tall shrubs. The other species, *Z. Perion*, is very common in summer, and may be taken with the finger and thumb at rest on the tops of flowers. This genus seems commoner in Cape Colony than here; at Cape Town on December 1st, 1878, I took several *Z. Zeuxo* on the hills around the town.

Pentila Tropicalis is a singular butterfly, of a gamboge-yellow tint speckled with black. Its flight is very weak, and curiously resembles a Geometra. When I first saw this species I imagined it was a Geometra fluttering in the bushes. Another *Pentila* has been discovered here within the last few years; it is much smaller than *Tropicalis*, and has a brisker flight. It is strange it was overlooked so long, since I found it close to Durban.

The Skippers number probably some forty species here; twenty species have fallen to my net. Some few bear a striking resemblance to the English *Alveolus;* one resembles *H. Comma*, only that it is much darker. Another, in the male, is not unlike *Actæon;* whilst a fourth, a black Skipper, in habits and contour resembles *Linea.* The loveliest of the Skippers, I think, is *Caprona Canopus*, a blossom-like insect with snowy wings tipped with ochreous. Unlike the English Skippers, it delights to sun itself on leaves of trees. Another Skipper of the same habits is *Cyclopides Metis*, a dark brown butterfly spotted with orange yellow. This is also a handsome insect, and is a true wood-butterfly, being taken at rest on the leaves of bushes in sunny openings in woods. It is plentiful at Inanda Woods, and I have taken two or three near Verulam. Several species allied to *T. Tages* occur, but they are all much larger, and not so "dingy;" one of the finest is *N. Ophion*, distinguished by the bluish white tint of the under side of the hind wings. The largest Skippers are comprised in the genus *Ismene*, the commonest being *I. Florestan*, a butterfly with a white patch on the under side of the hind wings. The three species of this genus are all rapid flyers, darting with extreme rapidity from flower to flower.

The moths of Natal are exceedingly numerous, the Bombyces being especially well represented. As soon as the shades of evening set in the tubular flowers are beset by a dozen species of hawk-moths, amongst them *S. Convolvuli* and *S. Celerio* being frequently, and *C. Nerii* rarely, taken. *A. Atropos* is common on walls, and the following English species occur:—*D. pulchella*, *S. sacraria*, and *Heliothis armigera.* Few of the butterflies or moths of Europe are to be found in Natal. This is to be accounted for by the isolated character of Africa as compared with Europe and Asia, and the presence of the great deserts, which act as barriers to insect migration. During the remainder of my residence in Natal I intend devoting much spare time to the study of the moths, the several hundred species I have already secured being very interesting.

Collecting here is very different from what it is in England. One has to be careful of not treading on snakes; this, however, I have done several times. And as for animal life, I have met with a leopard, bushbucks, iguanas, monkeys, crocodiles, pythons, imambas, puff-adders, &c., in my rambles. However, with a couple of loaded revolvers in my pockets, I never feel alarm, although one large forest on the coast is noted for its leopards.

PS.—Since writing the above I have met with the following butterflies more or less plentifully:—*Neptis Melicerta*, *Athyma Saclava*, *Pyrameis Hippomene*, and *Junonia Pelarga.* I have also captured a hermaphrodite specimen of *Anthocharis Antevippe*, the right wings being male, the left pair female.

Verulam, Natal, August 31, 1879.

THE TORTRICES OF SURREY, KENT, AND SUSSEX.

By Walter P. Weston.

(Continued from p. 61.)

Sciaphila nubilana, Hub.—Common everywhere in June and July, flying at dusk over whitethorn (*Cratægus oxyacantha*). The larvæ feed in the shoots, and the pupæ may be obtained by beating into an umbrella about the middle of May.

S. perterana, Guen.—Widely distributed, but local. It seems confined to chalk and limestone soils, and is much commoner by the sea-shore than inland. The imago appears in June and July; the larvæ are to be found in May and June feeding in the blossoms of *Chrysanthemum*, *Hieracium*, and other *Compositæ*. Their presence may be noticed by the flower-rays being carefully turned down so as to form a covering. It occurs at Sanderstead, Croydon, Box Hill, Darenth, Hastings, Folkestone, &c.

S subjectana, Guen.—Generally abundant everywhere in June and July.

S. virgaureana, Treit.—Not so common as the previous species, but widely distributed. The larva is a polyphagous feeder in May and June; the imago appears in June and July.

S. chrysantheana, Dup. = *Alternana*, W. V.—Distributed, but not common. The larvæ feed in the ox-eyed daisy, and would probably be met with on other *Compositæ*. The imago appears in June and July.

S. communana, H.-S.—Distributed, but not common. This species is longer in the wing than *Subjectana*, and of a unicolorous brownish black colour. It is to be met with in June and July, flying over various mixed herbage, and is partial to railway slopes. Though frequently met with in company of the three previous species, the unicolorous hue of its wings, together with their longer shape, easily separate it from them.

S. pasivana, Hub. = *sinuana*, Steph.—A local and rare species. Mr. C. G. Barrett, to whose kindness I am indebted for much valuable information, especially in this group, informs me that he has seen only one specimen from these counties, which was captured by the Rev. E. N. Bloomfield, near Hastings. The capture of specimens under this name has also been recorded from Darenth and West Wickham.

S. hybridana, Hub.—Widely distributed and not uncommon in whitethorn hedges. The imago appears in June and July, and is sluggish in its movements. The female is much smaller than the male, and might be mistaken for another species. I have occasionally bred this species from pupæ beaten from whitethorn in May.

Sphaleroptera ictericana, Haw.—Widely distributed and common. The larva feeds on the ox-eyed daisy (*Chrysanthemum leucanthemum*), and many other low plants in May. The male may be taken abundantly at dusk, in June, flying over mixed herbage, while the female is seldom taken on the wing, but may be found at rest towards the end of the month on palings, &c. I have found them abundantly on the trunks of pollard willows.

Capua ochraceana, Steph.—Distributed, and not uncommon in

May and June among hornbeam (*Carpinus betulus*), upon which the larva is said to feed.

Clepsis rusticana, Treit.—Local and not uncommon. The imago occurs in May and June, flying over grassy slopes and damp places in woods. Messrs. Howard Vaughan and Sydney Webb met with it once commonly at Tilgate Forest flying in the afternoon sunshine.

Bactra lanceolana, Hub.—Abundant in all damp and marshy localities from May to September. It is a very variable insect, especially in size, the largest specimens appearing about midsummer. The larva feeds in the stems of the common rush (*Juncus conglomeratus*).

B. furfurana, Haw.—Local and not common. The imago appears in June and July, and occurs among rushes at Folkestone and other places in Kent, and a single specimen was taken at light near Hastings.

Phoxopteryx siculana, Hub.—Distributed, but not common. The imago occurs in May and June among narrow-leaved buckthorn (*Rhamnus frangula*), and the larva should be looked for on this shrub. It has occurred at Darenth, West Wickham, and Birch Woods; Croydon and Wimbledon; Tilgate Forest, Haslemere, Hastings, &c.

P. uncana, Hub.—Distributed throughout in heathy places. The larva is said to feed on heath (*Calluna*), but I once met with the imago very abundantly flying among some small birch bushes and dwarf sallows, on the leaves of which they were frequently observed to settle. There was no heath near. The localities are Croydon, Wimbledon, Weybridge, Ashstead, Coombe and West Wickham Woods; Tilgate Forest, Hastings, Haslemere; Tunbridge Wells, and Darenth Wood.

P. biarcuana, Steph.—Local and not common. The imago occurs in June and July among dwarf sallows on moors and heathy places. It has been taken at Haslemere, Tilgate Forest; Wimbledon, Weybridge; Darenth, and Tunbridge Wells.

P. inornatana, H.-S. = *subarcuana*, Wilk.—Commoner and more generally distributed throughout these counties than the preceding species. It is double-brooded, the imagos appearing in the spring, sometimes as early as April, and again in September. The spring brood is the more plentiful. It occurs at Weybridge, Wimbledon, Darenth, Tunbridge Wells, and near Uckfield.

P. comptana, Frol.—Abundant on all chalk downs. There are two broods in the year, the first appearing in April and May, and the second in August and September. From its small size and short jerky flight it requires a good eye to detect it, and it is not easy to capture. The larva is said to feed between the leaves of *Potentilla*.

P. myrtillana, Treit.—Local and not common in these counties. The imago appears in June; the males may be taken towards sunset flying over bilbery (*Vaccinium myrtillus*); the females at rest on the same plant. It occurs near Haslemere; on the White Hills, near Caterham; and at Sevenoaks.

P. lundana, Fab.—Common and widely distributed throughout. It is double-brooded, occurring in May and again in August, and is a free flier. The larva feeds between united leaves of the bush vetch (*Vicia sepium*), and the meadow vetchling (*Lathyrus pratensis*).

P. derasana, Hub.—Local, but not uncommon where it occurs. The imago appears in June and July, and occurs in the lanes round Croham-Hurst, Surrey; at Haslemere, Tilgate Forest; and the lane leading to Darenth Wood, where it is sometimes abundant. Mr. C. G. Barrett writes, "It has been reared by Mr. Machin from larvæ feeding on *Rhamnus frangula*.

P. diminutana, Haw.—A local and uncommon species. The imago appears in June and July, and, Wilkinson says, among sallows; but I have on more than one occasion beaten a single specimen from wild cherry. It occurs at Croydon, Box Hill, and West Wickham; Darenth Wood, near Strood, and Folkestone; Haslemere, Tilgate Forest, and Hastings.

P. Mitterbacheriana, Schiff.—Common in all oak woods. The imago appears in May and June, and may be taken in abundance at dusk flying round the oaks. It is strong on the wing and flies high. The larva feeds on the oak.

P. upupana, Treit.—Rare, but widely distributed. The imago appears towards the end of May, and in June among oaks, and should be looked for at dusk flying around those trees. It has occurred at West Wickham several times; also at Darenth Wood, near Strood, Tunbridge Wells; and near Hastings. The larva feeds on the oak.

P. lactana, Fab. = *harpana*, Hub. = *ramella*, Linn. — An uncommon species, but distributed. The imago appears in May and June among aspen (*Populus tremula*). Wilkinson gives as localities West Wickham Woods, Sydenham, and Dartford Heath fence; it also occurs at Wimbledon, Sidcup, Tilgate Forest, and Folkestone. The well-known locality for it in Darenth Wood is now closed to entomologists.

(To be continued.)

NOTES ON HYMENOPTERA.

By Edward Capron, M.D.

The general scarcity of insect life was equally apparent last summer in the neighbourhood of Guildford as in other districts. The Aculeates and fossorial group of Hymenoptera were hardly to be seen; especially was it the case among the autumnal *Halicti*, which, usually abundant here on the heads of the various *Compositæ*, were last season entirely absent. In these families the only capture worth recording was another male of *Crabro pterotus*, taken almost exactly in the same place as the one I recorded in 1878. I bred thirteen specimens of *Spilomena troglodytes* from some dead bramble sticks, one male only among them; and caught on the wing one example of *Stigmus pendulus*. In the Tenthredinidæ two specimens of *Nematus lucidus* were my only additions. In the Ichneumonidæ I was more fortunate; and during the few really hot and fine days secured several fine species not hitherto recorded as occurring in Britain, and many of the less common ones already on the list.

Among the new species, *Eumesius egregius*, Holmg., of which a single female occurred, is one of the most beautiful and interesting; a good figure is given of it in Vollenhoven's 'Pinacographia' (pl. 33, fig. 8). With it I took also a female of another species of the same genus, which I am unable at present to identify: the abdomen is totally black, as also the posterior legs, the two anterior pairs being testaceous; the thorax, also, has no yellow markings.

Catoglyptus pulchricornis, Holmg.—Of this I took two females; it may be easily recognised by the tricoloured antennæ and peculiar aculeus turned up almost in a semicircle. Of the same genus both *C. fortipes* and *C. fuscicornis* occurred.

A *Mesoleius* I could not determine satisfactorily was returned to me by Mr. Bridgman as *M. fallax*, Holmg., and I have little doubt is that species.

Lissonota caligata, Gr.—One specimen, a female; easily recognised by its very short aculeus.

L. lineata, Gr.—Gravenhorst never met with the female of this insect; and the Rev. T. A. Marshall has in his catalogue considered it only a variety of *L. bellator*. During the summer Mr. Buckler, of Emsworth, bred from some larvæ of *Crambus contaminellus*, both male and female, which he very kindly sent to me in a living condition: it is most undoubtedly a good species, and totally distinct from *L. bellator* not only in colour, but in the punctuation of the abdomen; it is more allied to *L. parallela;* the female has the same yellow markings on the thorax as the male.

Mesoleptus coxator, Gr.—Three specimens of this distinct species occurred.

Œdemopsis scabriculus, Gr.—Like Mr. Bridgman I have taken examples both with and without the white ring to the antennæ; I can see no specific difference in them.

Cryptus bivinctus, Gr.—One example occurred of this fine species. I was surprised to find Mr. Marshall considers it to be the male of *Phygadeuon digitatus*. Not only does it appear to me to be a true *Cryptus*, and totally unlike any male *Phygadeuon*, but I have taken a male *Phygadeuon* which is without doubt the true male of *P. digitatus;* it is in every respect identical, except wanting the white ring to the antennæ. I believe Gravenhorst was right in the first instance; and it is now for someone to find the female of *C. bivinctus*.

The only *Pezomachi* were *Aptesis nigrocincta* and *A. microptera*, and *Hemimachus fasciatus* and *H. rufocinctus*.

Ichneumon albicinctus, *I. varipes* and *I. latrator* were abundant; the singular variety of the latter with undeveloped wings also occurred in moss; and Mr. Billups has also taken the same variety as well as the usual type.

I. terminatorius.—One example.

Amblyteles margineguttatus.—One example; a pretty species.

Phæogenes stimulator, *P. calopus* and *P. ischiomelinus.*—All more or less common.

Tryphon brachyacanthus.—One.

In the Ophionidæ, *Agrypon canaliculatum*, *Casinaria orbitalis*, *Sagaritis zonata*, and one specimen of *Banchus falcator*.

Singular to relate I have never taken any species of *Exetastes*, though apparently abundant elsewhere.

The genus *Limneria* abounded; many species I have not been able to determine with accuracy.

Mesochorus also gave me thirteen species, among them being *M. thoracicus*, *M. strenuus*, and *M. anomalus*.

In the genus *Megastylus* I have to add *M. borealis*, Holmg., taking at the same time *M. cruentator* and *M. mediator*.

In the Bracons I can also add several species new to Britain, the most interesting one being the fine *Homolobus discolor*. I took five females of this insect by beating some hazel. This appears to be the largest species of that tribe, and may easily be distinguished by the closed areolet of the inferior wings, as in *Zemiotes*, but having the sessile body of a *Macrocentrus*.

Rogas brevicornis, Wesm., and *R. tristis*, Wesm., also occurred, and appear to be previously unrecorded.

Among others I may also mention *Heterogamus dispar*, *Eubadizon pectoralis*, *Ichneutes reunitor*, *Macrocentrus marginator*, *M. thoracicus* and *M. linearis*, *Phænolexis petiolata*, *Symphya hians*, *Cœlinius niger*, *C. gracilis* and *C. elegans;* and many species of *Alysia*.

The *Oxyura* also yielded many species; the difficulty of their determination allows me to give two only as new, viz., *Spilomicrus major*, Voll., and *S. flavipes*, Thoms.

I added also the singular *Helorus anomalipes* and *Ismarus campanulatus* to my captures; and taking into consideration the extremely unfavourable season have no reason to be dissatisfied with my success in 1879.

I may also mention the occurrence in July of *Fœnus minutus*, Tournier. This appears a very distinct species, and I therefore give a short description of it. I only obtained one female.

Fœnus minutus, Tournier.—Length 4¾ lines; black; apex of first segment and apical half of second segment of abdomen red; tarsi and extreme base of tibiæ dark reddish; aculeus about as long as the first abdominal segment.

Shere, March 1, 1880.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Life-history of Amphysa prodromana, *Hub.* = **Walkeri**, *Curtis*.—On April 24th, 1876, I received eggs of this species from Mr. White, of Droylsden, from which I bred a fine series of the perfect insect in March and April, 1877. I kept the brood up for several seasons, experimenting for the purpose at first of ascertaining their proper food, and afterwards to see what they would or would not eat. At last I gave them up, for I found they would eat—I may say—anything, except the leaves of trees; but there is no doubt that they prefer *Potentilla tormentilla*, and live upon it in a state of nature. Some of the larvæ were fed in a flower-pot, in which that plant, *Rumex acetosa*, and narrow-leaved plantain were grown together, with knotgrass, *Silene*, &c. They ate all these plants, but preferred the *Potentilla;* next to that the largest number preferred the plantain, turning the edge of the leaf over to form a comfortable home. Having taken to a plant they do best if supplied with that food for the remainder of the larval state, and do not readily leave it to go to other food, nor do they do well if the food is changed. The eggs are laid in patches upon *Vaccinium* leaves, and upon those of other plants, where I have since taken them; they are embedded in a glutinous substance: when dry this gives the leaf a yellowish blotched appearance, which on close examination shows the eggs laying in the blotch. The eggs are laid at the end of March and during April, hatching in May; the larvæ make up in June; the perfect insects appear in the following March and April. The larvæ are rather slender; colour dull pea-green, inclined to olive; size over three-eighths of an inch; head light ochreous, with two distinct black spots on the sides below; corselet broad, with suture indicated, and covering the whole of the upper part of the second segment; dorsal region dark, and the papillæ light, but not well pronounced; spiracular region light; anal region light, with large light claspers. Pupæ formed during June, amongst the dead leaves laying at the bottom of the breeding-boxes. Mr. White first discovered this larva, and kindly sent eggs to me, as before observed. — C. S. Gregson; Rose Bank, Fletcher Grove, Liverpool, February 22, 1880.

LEPIDOPTERA IN 1879.—My entomological experience in 1879 was but little, but some notes, made from time to time, may prove interesting for comparison, and will show how exceptional was the season.

Lycæna Adonis.—This butterfly, from some cause, is evidently becoming much less common. Before leaving Folkestone, on September 22nd, I only took six, though I was several times on the downs. On October 6th, during a brief visit, I captured about twenty specimens; some of the females had the blue tint of the summer brood.

Nola albulalis.—My first specimen was captured on July 29th; but it was the first week in August before any numbers were to be found.

Calligenia miniata and *Acidalia rusticata.*—A few of each, apparently just emerged, taken in August.

Eurymene dolabraria.—One specimen bred from galls.

Aspilates gilvaria.—Out plentifully in good condition, at Dover, in September.

Cidaria sagittata.—About thirty specimens, bred from larvæ taken in 1877; emerged between June 18th and July 20th.

Botys pandalis.—Not out till the middle of June.

Spilodes palealis.—Taken at Folkestone the third week in August.

Cryptoblabes bistrigella.—Two bred from galls, June 9th and 12th.

Tortrix Branderiana.—A female taken at Folkestone, September 12th.

Peronea Schalleriana.—The ordinary form, and the variety *Latifasciana.*

Sciaphila perterana.—A fine and very variable series.

Grapholita nigromaculana, *Pædisca opthalmicana*, and *P. solandriana.*—All taken at Folkestone in September.

Ephippiphora nigricostana.—Several bred between June 8th and 22nd.

E. signatana.—Taken at the end of July near Strood.

E. gallicolana.—Bred from galls between May 12th and June 23rd; very few, but large in size.

Coccyx splendidulana.—Bred from galls, coming out at intervals between March 30th and June 13th.

Heusimene fimbriana.—A fine series; emerged from galls between March 19th and April 29th.

Retinia turionana.—Scoured the country far and wide, and only bred four specimens from pine shoots. This insect seems to have disappeared in many localities where it used to occur.

Stigmonota puncticostana.—Taken near Strood at the end of June.

Argyrolepia Dubrisana.—Several large and finely-coloured specimens, taken at Folkestone in September.

Cochylis gigantana.—A long series, taken at Dover and Folkestone between September 4th and 20th. Those taken on the last-mentioned day had only just emerged.

C. inopiana.—A few captured, near Strood, in August.

Lemnatophila salicella.—One bred from galls, March 19th.

Depressaria pallorella.—Several specimens, taken at Dover in September. This species must be looked for at the bottom of tufts of grass.

Pterophorus acanthodactylus.—A rather long series, taken at Croydon in August.

—Batershell Gill; 9, Cambridge Terrace, Regent's Park, N.W.

Notes from Harwich for 1879.—During the past season I captured seventy-one species of Noctuæ at sugar. *Thyatira derasa* was plentiful, and not at all shy, as mentioned by the Rev. J. Greene in his 'Insect Hunter's Companion'; they did not attempt to move whilst being boxed. Of *T. batis* I took two; *Leucania littoralis*, three; *Senta ulvæ*, one; *Dipterygia pinastri*, plentifully; *Mamestra abjecta*, five; *Apamea gemina*, plentifully; *Agrotis suffusa*, three (this species was very plentiful in 1878); *A. saucia*, plentifully; *A. ripæ*, plentifully; *Aplecta advena*, two; *Hadena adusta*, one; *H. suasa*, seven; and of *H. genistæ*, eight. At light I captured two specimens of *Leucania phragmitidis*, one *Plusia iota*, and two *Coremia quadrifasciaria*; and I bred one *Luperina cespitis* from a pupa I took at the roots of a poplar tree.—F. Kerry; Harwich.

A Month in the New Forest.—I spent the month of September, 1879, at Brockenhurst, in the New Forest, with the primary object of taking a good long series of *Peronea cristana*; but although I had the best localities pointed out, and the most systematic method of working kindly shown me by Mr. E. G. Meek, I failed to obtain more than a dozen specimens. Yet I was assured by George Gulliver of that place—who also showed me where to get "t' buttons"—that in 1878 they were not uncommon, and in 1877 plentiful. *Leptogramma literana* were to be had freely, and I met with two or three striking varieties. *Peronea sponsana* were not scarce, neither were *P. schalleriana* and *P. comparana*. *Teras caudana* also was frequent, and a few varieties of that species. At larvæ beating I was more successful. Of *Stauropus fagi* I got four, but only one reached the pupal stage. Also a few each of *Dicranura furcula*, *Notodonta dictæoides*, *N. dromedarius*, *N. ziczac*, *N. dodonea*, and *Thyatira batis*; several of *Platypteryx falcula* and *Tephrosia consonaria*, and of *Diphthera orion*. *Acronycta leporina*, *Eurymene dolabraria*, *Amphydasis betularia*, *Ephyra trilinearia*, *Tephrosia* *crepuscularia*, *Halias prasinana*, and *Lithosia rubricollis*, a good number; also a few unrecognised species of larvæ. On one small sallow bush in a hedge I found thirty-two larvæ of *Smerinthus ocellatus*, some nearly full fed, others quite small; six were striking out from one twig. I thought at first sight they were merely curled leaves; I have often found the larvæ before, but never saw more than two or three near each other. Ragwort yielded two or three species of *Eupithecia* larvæ and *Euchelia jacobeæ.* I sugared one or two nights, but as I only saw one *Catocala promissa* and a few *Amphipyra pyramidea* I turned my attention to the heath blossom, though without any better success, for, with the exception of *Cidaria testata*, which was abundant, I only got one *Platypteryx hamula*, one *Agrotis agathina*, one *Noctua neglecta*, and three *N. C-nigrum.*—RICHARD SOUTH; 13, Bonchurch Villas, Ealing, January 8, 1880.

CARADRINA MORPHEUS.—I bred about two dozen specimens from larvæ found in October, 1878, on various low plants in Hackney marshes, but principally on wild hop (*Humulus lupulus*) and *Chenopodium.*—W. MACHIN; 22, Argyle Road, Carlton Square, E., Dec. 11, 1879.

COLEOPHORA WILKINSONELLA, &c.—I have pleasure in recording the occurrence of this scarce northern species in the South of England. While searching the birches for Micro-lepidoptera in the forest at Snaresbrook, in October last, I found three cases containing larvæ of the above species, and a friend also took two. *Ornix betulævorella* was commoner than usual; and *Lithocolletis ulmifoliella* plentiful on the same trees; and on hornbeam were *L. carpinicolella* and *L. tenella.*—WILLIAM MACHIN; 22, Argyle Road, Carlton Square, London, E., March 9, 1880.

NOTES ON BREEDING ACRONYCTA LEPORINA.—The abnormal summer of 1879 did not prove with me an unprofitable one, so far as collecting Noctuæ is concerned; in fact it was better than the two previous seasons, and about equal to 1876, in which year, on July 17th, I took a female *Acronycta leporina*, from which I have bred a nice series. The life-history of this brood having extended over three years, I now venture to offer my notes, thinking that they might be of interest to some of your readers. Upon taking the moth (a female) I placed it in a box with some sugar mixture, of which it freely partook. On the following day (the 18th) it deposited four eggs, and added twenty-four on the 19th, twenty-three on the next day, thirty-one on the next, and four on the 22nd. The fertile eggs in twenty-four hours changed to a chocolate colour; but about half of the whole proved to be barren. The first larva emerged on July 27th. Unfortunately at the end of that month I had to leave home for four days, so the young brood had to take their chance upon a small branch of birch placed in water and covered with a glass. Upon my return only nineteen were alive; two of these were of the dark variety. By September 2nd they were full fed: I then tendered them some pieces of cork and blocks of half-decayed wood; seventeen preferred the latter, while two took the former. In examining their holes I thought it worthy of remark, that after the larva has entered a little way it turns off at an angle, the pupa remaining at the extreme end, so that it is well provided for against the intrusion of birds or other enemies. Three imagines appeared the next year; the first on June 17th, and the last on July 5th. I then tried to force the remainder; but although they were kept for three weeks in a very warm temperature they would not yield to the treatment, and were ultimately removed to a cooler place to see what 1878 would produce. The first half of June in that year was unusually cold and damp, but in the latter part of the month the weather became excessively hot: the result was that nine moths came out between the 12th and 28th. The next did not appear till July 6th, 1879, another on the 9th, and one more on the 12th, which completed a total of fifteen. Upon opening one of the blocks last November I discovered that a pupa was still alive; however it has since died. In another instance I found a dead moth partly out; but owing to another larva having pupated in front of the same it could not escape. Should it be thought that in a natural state this species only requires heat and moisture to annually produce a full brood, I would point to the fact that they were placed under these circumstances in 1878; but between the 21st and 30th of June only five came out, while the dreadful cold and wet days from the 6th to the 12th of last July also yielded three specimens. It also happened to be the exact number which attained their perfect condition during the first year of their existence.—H. T. Dobson, jun.; New Malden, Surrey, February 23, 1880.

LATHETICUS ORYZÆ: A NEW BRITISH COLEOPTERON.— Through the industry and perseverance of Mr. T. R. Billups this insect has been added to the list of British Coleoptera. Although specimens have been in the British Museum, and other collections, for some time, it has remained to this present time a nondescript. As it turned up conspicuously among those other grain insects, about which Mr. Billups wrote an article in the November 'Entomologist' (Entom. xii. 267), attention was called to it; and the result has been that it has been described by Mr. C. O. Waterhouse, under the above name, in the 'Annals and Magazine of Natural History' for February, 1880, pp. 147, 148. Its place in our cabinets will be between the genera *Tribolium* and *Gnathocerus*. It is a widely-distributed insect, but its claim to be inserted as a British beetle is this. It occurred to Mr. Billups in wheat sent him from Mr. Fitch's granaries, and since then I have it in a sample of English weevilled wheat from Addiscombe; but the strongest proof that it is entitled to a place is that it was obtained by Mr. Marsh, about five or six years ago, in Burnt Ash Lane, by sweeping. Now that attention is drawn to it we shall probably hear of it from other parts. Another insect obtained from the same wheat at the same time was a very small *Læmophlœus*, distinct from *L. ferrugineus*, and which answers to the *L. minimus* of Stephens's 'Manual.' This is *Læmophlœus pusillus*, Schön., of Waterhouse's Catalogue, and of Rye's also; but it is omitted by Sharp. This insect has also been under careful inspection, and will be mentioned by Mr. Billups in his next article on the corn weevils and their associates.—VINCENT R. PERKINS; 54, Gloucester Street, S.W.

[All of these are undoubtedly imported insects. They have certainly bred in England in limited localities, but can scarcely be said even to be naturalised; the same may be asserted of many other so-called British insects, of which, however numerous they may be in granaries, &c., single specimens only have been found really at large, and that but seldom,—escapes, as it were, from the main body. They may perhaps be said to belong to our British fauna; but I think that these, and many others which we are sure are not indigenous, ought to be carefully distinguished from truly British insects.—J. A. P.]

FORCING LEPIDOPTERA.— On February 14th, by way of experiment, I placed six cocoons of *Saturnia carpini*, six *Bombyx* *quercus*, three *Orgyia pudibunda*, and two pupæ of *Pieris rapæ*, in one of my breeding cages, upon the mantelshelf of my sitting room, with a view of forcing them. The following was the very gratifying result:—On the 18th a fine male *O. pudibunda* made its appearance, followed on the 20th by another, the remaining one (also a male) not coming out until this morning; one of the *P. rapæ* hatched on the 22nd, the other I find is dead; on the 23rd the first of the *S. carpini* (a male) appeared, and on the following day a female, who has laid about sixty eggs; no more appeared until the 27th, when I discovered another male, followed on the 28th and 29th by a female and two more males; the *B. quercus* have not yet shown themselves. I may as well mention that the *S. carpini* and *P. rapæ* emerged between five and six p.m.; the *O. pudibunda* in the morning.—EDMUND SHUTTLEWORTH; 59, Charlotte Street, Portland Place, W., February 29, 1880.

THE ERADICATION OF MITES.—Some time since, on my return home after a few weeks' absence, I found these dreadful pests causing much havoc in my boxes. After removing the specimens most affected I treated the rest with a solution of carbolic acid, washing over part of the inside of the boxes with the same solution. After this treatment for some days I placed some of the dust, which collected at the bottom of the boxes, under the microscope, and to my surprise found that the mites were not dead. I then tried bichloride of mercury (common sublimate) and cyanide of potassium successively, but with no better result. I then determined to try carbon bisulphide (the vapour of which has been used with tolerable success for the extermination of *Phylloxera*, by the gradual decomposition of sulpho-carbolate of lime), and poured a few drops of the pure liquid into each of my boxes, closing them at once, and renewing the dose after a few days. On examination of the dust I then found them all killed. It is essential for their destruction that the boxes be charged with the vapour for some days, otherwise only the perfect insects will be destroyed. The chief objection to the use of this chemical is its bad smell, but it has the advantage of entirely evaporating on leaving the boxes exposed for an hour or so.—N. C. GRAHAM; Silwood, Tulse Hill, March 7, 1880.

ERRATA.—Page 62, line 9 from foot, for "*silene*" read "*Selene*"; and line 4 from foot, for "*Iriglaus*" read "*Juglans*."

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INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

BY J. B. BRIDGMAN AND E. A. FITCH.

No. II.—ICHNEUMONIDÆ.

GRAVENHORST'S 'Ichneumonologia Europæa' (1829) is the text-book of Ichneumons generally, but of the first family, Ichneumonidæ, Wesmael has made himself the authority, *par excellence*. His eight remarkably lucid memoirs,* published by the Brussels 'Académie Royale,' were, however, never completed and collated by himself; which is to be regretted. Wesmael primarily divided the Ichneumonidæ into five subfamilies, as follows:—

A. Spiracles placed between the middle and apex of 1st segment.
a. Metathoracic spiracles linear, or linear-elliptic; rarely oval.
* Petiole of abdomen not depressed.
† Abdomen of female with an acute apex; the last ventral segment more or less remote from the base of the aculeus. - - - - 1. *Ichneumones oxypygi.*

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* "Tentamen dispositionis methodicæ Ichneumonum Belgii" (1844, 'Nouv. Mém. Ac. Brux.,' xviii., 238 pp., 1 pl.); "Mantissa Ichneumonum Belgii" (1848, 'Bull. Ac. Brux.,' xv., pt. 1, pp. 138—187, 292—341); "Adnotationes ad descriptiones Ichneumonum Belgii" (1849, 'Bull. Ac. Brux.,' xvi., pt. 1, pp. 35—44); "Ichneumones platyuri Europæi" (1853, 'Bull. Ac. Brux.,' xx., pt. 3, pp. 297—328); "Ichneumones amblypygi Europæi" (1854, 'Bull. Ac. Brux.,' Annexe, pp. 77—142, 1 pl. with 17 figs.); "Ichneumonologica miscellanea" (1855, 'Bull. Ac. Brux.,' xxii., pt. 2, pp. 362—435); "Ichneumonologia otia" (1857, 'Bull. Ac. Brux.,' 2nd ser., ii., pp. 355—426); "Remarques critiques," &c. (1859, 'Mem. couron. Ac. Belg.,' 8vo, vol. viii., pp. 1—99).

†† Abdomen of the female obtuse at the apex; the last ventral segment reaching, or almost reaching, the base of the aculeus. - - - - 2. *Ichneumones amblypygi.*

** Petiole slightly depressed (that is the transverse diameter is a little larger than its vertical diameter). 3. *Ichneumones platyuri.*

b. Metathoracic spiracles circular. 4. *Ichneumones pneustici.*

B. Spiracles placed in the middle of the 1st segment of the abdomen. - - - 5. *Ichneumones heterogastri.*

To the above Holmgren has added, in his valuable but unfinished 'Ichneumonologia Suecica' (1864—71):—

1. *Ichneumones oxypygi:* 2nd to 4th ventral segments of the male furnished with an elevated fold after death.
2. *Ichneumones amblypygi:* 3rd to 8th or 4th to 8th ventral segments smooth; 2nd and 3rd segments sometimes have a short elevated fold.

The first division is easily recognised, as far as regards the female, by the last ventral segments having a longitudinal slit, which is wanting in the other divisions. The males are not so easily distinguished, but the presence of the ventral fold is the best mark; still this is sometimes present in the *I. amblypygi.* Further notes to the 'Ichneumonologia Suecica,' by Holmgren, are now in course of publication in the 'Entomologisk Tidskrift;' and Tischbein's recent tables, in the Stettin 'Entomologische Zeitung,' should specially be referred to.

We shall not waste space by describing the general appearance of the family of Ichneumonidæ, because there are now so many good figures in various works which give a much better idea of the insects than we could do by description. The number of species is large. Kirchner makes 556 in his 'Catalogus Hymenopterum Europæ' (1867), but of these it must be said that their synonymy has received but little attention. A few small genera belonging to the Cryptidæ and Pimplidæ are also here included amongst the Ichneumonidæ. Dours, in his 'Catalogue synonymique des Hyménoptères de France' (1874), gives but 135 species; and here also *Stilpnus* and one or two other small Cryptid genera are included. Marshall's first 'Catalogus' (1870) included 262 British species; his Entomological Society's Catalogue, which is strictly synonymic, contains 258 species, and to these there are a few additions to be made, which will be mentioned amongst their respective genera.

The *Ichneumones oxypygi* have been tabulated by Holmgren, as follows:—

A. Scutellum generally slightly convex, slightly sloping at the tip.
a. Apex of clypeus emarginate: head of female buccated or swollen; abdomen narrow and pointed.
Gen. 1. *Chasmodes*, Wesm.
b. Apical margin of clypeus entire, or sometimes somewhat sinuous.
* Abdomen of the female with 8th dorsal segment exserted.
Gen. 4. *Exophanes*, Wesm.
** The 8th dorsal segment not exserted.
Gen. 2. *Ichneumon*, Lin.
B. Scutellum somewhat gibbous, abruptly sloping behind; sides of the metathorax with spines.
Gen. 3. *Hoplismenus*, Grav.

Before commencing the tables of species it must be observed that many, or perhaps we might say most, of these insects vary greatly in coloration; for instance, the face of the male is generally marked with white or yellow; sometimes the face is completely pale, sometimes only a thin streak by the sides of the eyes, and sometimes the face is quite black; these differences will occur as varieties of the same species. The legs also in one variety will be quite black, except that the front pair are slightly pale, whilst an extreme variety will have all the legs red. The same with the marks on the thorax, which are generally confined to the collar, lines or spots before and below the wings, the scutellum and post-scutellum; these sometimes are present, sometimes entirely wanting. So also with the abdomen; some of the black species will have the margins obscure red, some of the segments more or less red, and in some instances the entire abdomen sordid red; for example, see the varieties of *Ichneumon lineatus*. Great variation also is found in those Ichneumons which have the abdomen yellow and black, the yellow being sometimes more or less marked with black; the same may be said of those we shall allude to as having the abdomen tricoloured

—that is, the middle segments red, and sometimes the base also; apex black, marked with white; those segments thus marked are generally the 5th to 7th, 6th and 7th, and sometimes only the 7th. The antennæ of the females have nearly always a white ring, sometimes between the base and the white ring it is red, then it is known as tricoloured. Looking at these deviations, it is quite impossible to note all the variations in such a table as we contemplate giving. These will, as far as possible, be pointed out by italicised letters in brackets; thus (*h*) means that the marks on the face vary, (*t*) the thorax, (*s*) scutellum black or *vice versa*; (*l*) the legs; and (*a*) the abdomen; slight variation will not be noted. The figures after the name denote the length in English lines, one-twelfth of an inch, and the figures before to the number of the species in Mr. Marshall's second catalogue, which, as has been said, is taken as our guide throughout. To that one must refer for the authority of the names and the synonymy of the species, which is often much involved. We shall take them in the divisions of Gravenhorst, namely, by colour, as this appears the more convenient method, and then subdivide them by the best means in our power, sometimes by colour and sometimes by structure. As the two sexes often vary much, each will be taken separately. The numerous species of the *Ichneumones oxypygi* and *amblypygi* are so much alike that in some cases the student will find it needful to refer to Gravenhorst, Wesmael, Holmgren, Tischbein, Brischke, or other authority, in order to be quite certain. Many of the generic and specific characteristics being taken from the underneath part of the insects in this family, examination will be greatly facilitated by pinning instead of carding them. Some half-dozen species of Ichneumonidæ are amongst our commonest Ichneumons, but others are seldom met with. Occasionally they may be captured at flowers, especially those of *Pastinaca sativa* and *Angelica sylvestris*, but they are mostly very lethargic in their habits, and when found at large are altogether averse to taking flight. The females of many species hybernate, and may often be found in some numbers under moss or the loose bark of trees. We believe that all the Ichneumonidæ are exclusively lepidopterous parasites. Ratzburg has, however, recorded four exceptions, but these all need confirmation. All the species are solitary in their parasitism; this will be fully treated of under the different genera.

CHASMODES, *Wesm.*

A. Scutellum white; legs greater part red; antennæ and abdomen of female tricoloured; abdomen of male, 2nd segment, red, or quite black; antennæ sometimes white ringed.
1. *motatorius*, 5—6 lines, male and female (male, *ant.*, *s*, *l*, *a*).
B. Scutellum white; antennæ white-ringed; abdomen and legs black; tibiæ of male white-ringed.
2. *lugens*, 8½ lines, male and female.

Both species of this genus are beautifully figured by Vollenhoven on plate 2 of 'Pinacographia.' The variable *C. motatorius* has several times been recorded as parasitic on *Nonagria typhæ;* and Mr. Weston has bred it from the closely-allied *N. geminipuncta.* The rarer *C. lugens* has not apparently been bred. The females of both species are known to hybernate as imagos.

ICHNEUMON, *Lin.*

SECTION 1.—Scutellum and abdomen black.

A. Antennæ with a white ring (females).
a. Tibiæ (especially the hinder one) white in the middle.
* Inner orbits of eyes straw-coloured. - 21. *periscelis*, 6—9 lines.
** Inner orbits red. - - - - - 73. *pallifrons*, 4—7 lines.
*** Inner orbits not pale marked.
† Hinder coxæ not pubescent beneath.
69. *nigritarius*, 5—6—7 lines (*h*, *l*).
†† Hinder coxæ pubescent beneath.
71. *fabricator*, 5—6—7 lines (*s*, *l*, *a*).
b. Hind tibiæ not white marked.
* Hind tarsi white-ringed. - - 130. *maculiventris*, 6 lines.
** Hind tarsi not white-ringed.
† Aculeus slightly projecting.
‡ Coxæ and trochanters black.
§ Thorax without white marks; areolet wide above.
× Stigma nigro-fuscous. - - - 17. *comitator*, 6—8½ lines.
× × Stigma pale red. - - - - - 18. *derasus*, 6 lines (*l*).
§§ Thorax with pale marks; areolet narrow above.
2. *bilineatus*, 6—8½ lines (*s*, *t*, *l*).
‡‡ Coxæ and trochanters red. - - 129. *maculicornis*, 2½ lines.
†† Aculeus as long as from the 5th to the 7th segment.
70. *punctifrons*, 3 lines.
B. Antennæ not white-ringed (females); greater part of legs red.
15. *impressor*, 6 lines.
A. Antennæ apical half red (males). - - 143. *rufipes*, 5—6½ lines.
B. Antennæ white-ringed (males).
69. *nigritarius*, 5—6—7 lines (*h*, *t*, *l*).
C. Antennæ not white-ringed (males).
a. Tibiæ (especially the hinder one) white-ringed.
* Front coxæ straw-coloured. - - - 21. *periscelis*, 6—9 lines.

** Front coxæ black; tarsi white; hinder apex obscure.
17. *comitator*, 6—8½ lines (*s*)
b. Hind tibiæ white outside.
* Face without pale marks. - - 144. *tibiator*, about 2 lines.
** Face with pale marks. - - 73. *pallifrons*, 4—7 lines (*s*).
c. Hind tibiæ not marked with white.
* Thorax not marked with white.
† Hind femur red; extreme apex black. 135. *obator*, 4—4½ lines.
†† Hind femur entirely red. - - - 63. *cessator*, 6—7½ lines.
††† Hind legs black.
‡ Front femur and tibiæ red. - 74. *maculifrons*, 5—5½ lines (*h*).
‡‡ Front tibiæ yellow. - 75. *coruscator*, 5—5½ lines (*h*, *t*, *s*, *l*, *a*).
‡‡‡ Front tibiæ white within, remainder black.
133. *nigerrimus*, 6 lines.
** Thorax with pale marks.
-+- Basal keels of scutellum black.
§ Face entirely yellowish white. - - - 79. *clericus*, 5 lines.
§§ Orbits internally and externally more or less yellow.
o Areolet towards the costa narrow. 2. *bilineatus*, 6—8½ lines (*s*, *l*).
oo Areolet towards the costa wide. - - - 18. *derasus*, 6 lines.
-+--+- Basal keels of scutellum white.
⬩⬩ 2nd segment somewhat longer than wide.
10. *lineator*, 6—9 lines (*t*, *s*, *l*, *a*).
⬩⬩⬩⬩ 2nd segment not longer than wide. - 15. *impressor*, 6 lines.

Section 2.—Scutellum black; abdomen black, with white marks.

A. Intermediate segments only marked with white (females).
24. *multicinctus*, 5½ lines.
B. Apical segments only marked with white (females).
a. Antennæ with a white ring.
* Hind femur red. - - - - - 79. *clericus*, 5 lines.
** Hind femur greater part black.
† Front tibiæ red.
‡ Middle area of post-petiole aciculate. 68. *Faunus*, 4—5 lines (*l*, *s*).
‡‡ Middle area of post-petiole scabriculous. 65. *gemellus*, 5½—7 lines.
†† Front tibiæ partly whitish or pale straw outside.
§ Middle area of post-petiole aciculate. 73. *pallifrons*, 4—7 lines.
§§ Middle area of post-petiole rather smooth and shining.
76. *varipes*, 2—3½ lines (male differs in having no ring on antennæ).
b. Antennæ not white-ringed. - - - 63. *cessator*, 6—7½ lines.

Section 3.—Scutellum white or red; abdomen black, or the edges pale.

A. Antennæ with a white ring (females).
a. Tibiæ without white.
* Thorax with no white line before the wings.
8. *sinister*, 7½—9 lines (*a*).
** Thorax generally with a white line before the wings.
† Gastrocœli of 2nd segment of abdomen distinct.
‡ Vertical orbits of eyes spotted with white.

§ Antennæ very slightly compresso-dilated before the apex. 9. *leucocerus*, 7½—9 lines.
§§ Antennæ distinctly compresso-dilated before the apex.
× Areolet of wing pentagonal. 10. *lineator*, 6—9 lines (*t*, *s*, *l*, *a*).
× × Areolet of wing triangular. - - - 12. *mæstus*, 3—4½ lines.
‡‡ Vertical orbits of eyes not spotted with white; lateral margins of scutellum white.
o Stigma nigro-fuscous. - - 25. *trilineatus*, 6—8 lines (*l*, *a*).
oo Stigma red. - - - - 26. *scutellator*, 5—6 lines (*a*).
†† Gastrocæli of 2nd segment almost entirely absent.
+ Areæ of metathorax, five complete. - 78. *jugatus*, 5—6 lines.
+ + Areæ of metathorax, three complete. 80. *rufifrons*, 2½—6 lines (*a*).
b. Tibiæ (especially the hind one) with white ring.
* Femora and part of tibiæ red. 71. *fabricator*, 5—7 lines (*s*, *a*).
Smaller and external radial nervure incurved. 72. *curvinervis*, 2½—4 lines (*s*).
** Hind femur and part of tibia black.
† Face black. - - - 22. *pistorius*, 7½—8 lines (*t*, *a*).
†† Face with the orbits white.
‡ Middle area of post-petiole aciculate-punctated. 20. *fuscipes*, 6—9 lines (*a*).
‡‡ Middle area smooth, or with a few punctures. 87. *oscillator*, 7½—9 lines (*h*. *t*, *s*).
A. Antennæ white-ringed (males).
* Post-petiole aciculate(‡) or punctate-aciculate(‡‡).
† Inner orbits and marks in front of wings white.
‡ Scutellum white and legs black.
§ Tibiæ without white marks. - - - 8. *sinister*, 7½—8 lines.
§§ Tibiæ with white marks. - 22. *pistorius*, 7½—10½ lines (*h*, *a*).
‡‡ Scutellum, lateral margins white; legs vary from greater part red to quite black (antennæ generally without ring). 25. *trilineatus*, 6—8 lines (*l*, *a*).
†† Face and marks before wings white.
** Post-petiole alutaceous (×) or scabriculous (× ×).
× Supero-medial area of metathorax semicircular. 70. *punctifrons*, 4—5 lines (*s*).
× × Supero-medial area of metathorax quadrate. 99. *ochropus*, 4—5½ lines.
B. Antennæ not white-ringed (males).
a. Tibiæ (especially the hinder one) ringed with white; legs the greater part black.
* Middle area of metathorax striated (aciculate).
† Hind tarsi not marked with white. 20. *fuscipes*, 6—9 lines (*a*).
†† Hind tarsi marked with white. 27. *multiannulatus*, 6—8 lines.
** Middle area of metathorax smooth, or with a few punctures.
‡ Gastrocæli of 2nd segment of abdomen obsolete. 80. *pallidatorius*, 2½—6 lines.
‡‡ Gastrocæli of 2nd segment distinct. - 87. *oscillator*, 7½—9 lines.
b. Hind tibiæ not marked with white.
* Front coxæ white, or marked with white.
† White marks on the angles before the scutellum. 11. *albicillus*, 5½ lines.

†† No white marks before the scutellum.

∷ Lateral margins of scutellum white. - 26. *scutellator*, 6 lines.

∷ ∷ Scutellum and post-scutellum marked with sulphur-colour.
102. *exornatus*, 4—6 lines.

** Front coxæ not white.

§ Middle area of post-petiole aciculate.

× Vertical orbits of eyes marked with white.

† No white marks at the base before the scutellum.

o Scutellum white. - - - - 9. *leucocerus*, 7½—9 lines.

oo Two white marks at the apex of the scutellum.
65. *gemellus*, 5½—7 lines (*s*, *l*, *a*).

ooo Lateral margins of scutellum white. 25. *trilineatus*, 6—8 lines (*l*).

§§ Middle area of post-petiole rugose; supero-medial area of metathorax quadrate; areolet of wing wide above; four front femora and tibiæ pale red; apex of scutellum only, white.
110 *albifrons*, 5½—6½ lines.

†† Basal keels before the scutellum generally white.

-+- 2nd segment of abdomen somewhat longer than wide.
10. *lineator*, 6—9 lines (*t*, *s*, *l*, *a*).

× × Vertical orbits of eyes not marked with white.

-+ Femora black.

∽ Hind tibiæ marked with faded straw-colour, or quite black.
31. *languidus*, 7—7½ lines (*t*).

∽∽ Hind tibiæ red, apical half black. 64. *submarginatus*, 5—7 lines.

-+-+ Femora and tibiæ red, apex of hinder one black.
52. *quadrialbatus*, 4—5 lines.

§§§ Middle area of post-petiole alutaceous(*), or rather smooth(**).
*71. *fabricator*, 5—7 lines (*h*, *s*, *l*, *a*).

External radial nervure much incurved at the apex.
**72. *curvinervis*, 2½—4 lines (*s*).

§§§§ Middle area of post-petiole aciculate-punctated.
No white marks before the wings; femora and tibiæ red, sometimes greater part black. 84. *monostagon*, 5—6½ lines (*s*, *l*).

Section 4.—Scutellum more or less pale; abdomen black; apical segments generally pale.

A. Scutellum and marks in front of wings reddish (females).
99. *ochropus*, 4—5½ lines.

B. Scutellum yellowish white, or white (females).

a. Tibiæ (especially the hind one) marked with white; legs the greater part dark.

* Vertical orbits broadly white. - 116. *cingulipes*, 6½ lines.

** Frontal orbits red, if not black.

† Areæ of metathorax, five complete. 27. *multiannulatus*, 6—8 lines.

†† Areæ of metathorax, three complete.

⁚ Hinder coxæ without pubescence beneath.
39. *melanotis*, 7—8 lines (*a*).

∷ Hinder coxæ with pubescence beneath. 28. *molitorius*, 6—9 lines.

b. Tibiæ not marked with white.

* Gastrocœli of 2nd segment of abdomen moderate.

† Middle area of post-petiole aciculate; vertical orbits not marked with white.

‡ Hind femora red.
§ Supero-medial area of metathorax subquadrate.
52. *quadrialbatus*, 4½ – 5 lines.
§§ Supero-medial area of metathorax transverse.
62. *quæsitorius*, 6—7½ lines.
§§§ Supero-medial area of metathorax subhexagonal, or semioval.
67. *saturatorius*, 5—6 lines (*l*).
‡‡ Hind femora dark.
× Hind tibiæ partly red.
o Scutellum closely punctured. - 40. *inquinatus*, 5½—6 lines (*a*).
oo Scutellum sparingly punctured.
+ Mesothorax and scutellum much higher than the metathorax.
64. *submarginatus*, 5—7 lines.
+ + Mesothorax and scutellum scarcely higher than the metathorax.
30. *computatorius*, 6—9 lines (*t*, *a*).
× × Hind tibiæ black. - - - 132. *microcephalus*, 6—7 lines.
× × × The pale part of tibiæ sordid straw-colour. 31. *languidus*, 6½ lines.
†† Middle area of post-petiole smooth. - 140. *relucens*, 6½ lines.
** Gastrocæli of 2nd segment of abdomen small.
† Middle area of post-petiole rugosely aciculate, or aciculate-punctated.
‡ Femora black. - - - 84. *monostagon*, 5—6½ lines (*h*, *l*).
†† Middle area of post petiole more or less punctated.
§ Back of the 7th segment white. - 85. *dumeticola*, 5—6 lines.
§§ Back of the 7th segment with a white spot.
86. *leucomelas*, 6—7½ lines.
‡‡ Femora red. - - - - - 93. *anator*, 4—5 lines.
A. Antennæ without a white ring (males).
a. Middle area of post-petiole aciculate. - 68. *Faunus*. 4—5 lines.
b. Middle area of post-petiole punctated. 93. *anator*, 4—5 lines.
B. Antennæ with a white ring (males).
* Four front femora and tibiæ greater part white.
116. *cingulipes*, 6½ lines.
** Femora and tibiæ not marked with white.
† Inner orbits faintly marked with white.
132. *microcephalus*, 6—7 lines.
†† Inner orbits not marked with white.
67. *saturatorius*, 5—6 lines (*l*).

(To be continued.)

CAPTURES IN NORTH LANCASHIRE IN 1879.

By J. B. Hodgkinson.

It may interest some of your readers to know how insect life appeared in the district through such a sunless summer as the last. I may say, with the exception of September, an almost constant daily downpour of rain fell in the district where I spent some six months of last season. This was at Dutton, about eleven miles from here, amongst the hills. No doubt Pendle

Hill, the highest hill in Lancashire being close to, had something to do with the rainfall. It was never safe for many hours to be far away from some sort of shelter, for, although it was cold and sunless, heaven's artillery opened fire both by night and day; during a great part of the season it seemed out of place not to be saluted by sudden heavy peals of thunder. One day, too near to be pleasant,—a sudden flash, a heavy crash, and the electric fluid,—a veritable thunderbolt fell a few yards from me.

Moths of all sorts were very late: March species out in June, such as *Tæniocampa rubricosa*, *Cidaria suffumata*, &c.; while July species, such as *Carsia imbutata*, I took at the end of September. Great numbers of specimens I should say never emerged at all; I should think especially such species as *Dicranura bicuspis;* I only saw one new empty case where the moth had gone, after looking over thousands of alder tree trunks. I did a little sugaring, but owing to the continuous rains I could not go into the woods which were most likely. Some of the woodland species seemed to be in countless numbers among the *Vaccinium* (bilberry); *Grapholita geminana*, *Peronea Caledoniana* and *Penthina sauciana* larvæ seemed to have literally blighted the plants; all the tops looked yellow, acre after acre; few of the berries were to be found. The old gamekeeper would not believe it was the work of caterpillars. For some time when the moths appeared it was simply a useless task to try to catch anything else but *Grapholita geminana* and *P. Caledoniana;* only hit a tree and they came out in swarms.

The country being comparatively new to me I had many a journey to no purpose on exploring expeditions. I did expect the honeysuckles to repay me with some *Plusia bractea;* but nothing better than *P. v-aureum* and *P. iota; G. geminana* became a pest and a plague, completely driving me from the lower grounds. I took a man with me to the *P. bractea* locality, where I used to take nothing else some thirty years ago. Well, moths came thick and fast; I struck twelve moths in succession. I came home in great glee, and, anxious enough to pin all my *P. bractea*, chloroformed them at once,—pins, poison, and all ready. I invited my wife to come and see the great catch: opening a box out tumbles *P. gamma;* twelve *P. gamma* instead of twelve *P. bractea* being the result. But off I go again and again, with the same luck; so at last I left utterly disgusted, not having got a specimen.

I hope this season to reverse the catch, for it is not often that two seasons together the same pests appear.

I next tried light: I used two rooms, with great flaming lights in each, with a looking-glass behind the lights. This was by far the most successful and easy way of catching moths I experienced. I left the lights all night, with a pane of glass broken in each room. I generally got up about two in the morning to put the lights out, and the moths were sticking all about next day. A crumpled-up newspaper was a favourite hiding-place for them. When I first began operations, with five lamps in one room, the policeman came hurrying up a couple of miles thinking the house was on fire. One night I took over forty species: it was rather curious to see what persistent comers were *Noctua brunnea*, *Miana arcuosa*, and *Nonagria fulva;* the former lasted over two months. Besides using the other rooms I opened my bed-room window, and left the lamp burning, turning the looking-glass to the window: in came *Arctia menthastri* and *A. lubricipeda* by scores. Next day, when the room was looked round, "ermines" were sticking about like snow-flakes, but no varieties worth note.

The best species, out of large numbers of moths that came to light, were *Caradrina alsines*, several; *Selenia lunaria*, *Pericallia syringaria*, *Stilbia anomala*, *Hydrœcia nictitans*, *Luperina testacea*, *Heliophobus popularis*, *Crocallis elinguaria*, *Plusia pulchrina*, *P. iota*, *Notodonta camelina*, *Epione apiciaria*, and *Scoparia muralis*, by the score. The only Plumes that came were *Pterophorus acanthodactylus*, and *P. Bertrami*. *Eupithecia pulchellata*, *E. subfulvata*, *E. assimilata*, &c., turned up. I hope *Dicranura bicuspis* will pay me a visit this season. My apparatus was rather too late in being applied last year.

The grandest little patch of collecting ground in the neighbourhood was about fifty yards of rough open ground in a young plantation. This place literally swarmed with Micros. In the space of ten yards I took over a hundred *Phygas bisontella;* I fancy the larva feeds in the stem of the knapweed; I could not sweep any off plants in flower. I swept the new *Trifurcula pallidella* and *Nemotois minimella*, *Cemiostoma Wailesella*, *Depressaria atomella* (the true species), and many other good species. One little wet sheltered corner on the moors yielded me a couple of hundred of the hitherto rare *Elachista alpinella* of Edleston. The female of this species is rather the handsomer.

Of larvæ, those of the larger species I may say were scarce. Two small aspens close to my door seemed to yield most. The first on the roll were *Tethea subtusa* in plenty, but difficult to breed. At the same time were *Pædisca opthalmicana;* I got tired of setting this species; I must have set a hundred and fifty or more, and I had not a decent specimen before. Under the same trees, in August, I put a sheet, and down came *Smerinthus ocellatus*, *S. populi*, *Notodonta dictæa*, and a cloud of *Cymatophora or* larvæ. I first thought the sheet was covered with sawfly larvæ. By beating the alders I got lots of larvæ of the *Notodontæ;* but it is hard work striking overhead with a twelve-feet pole; only one larva of *Dicranura bicuspis* came, and that fell on to a lad's jacket. It is a lovely larva, and for colour puts all the others of the genus into the shade. There is a little history about this larva: I nursed it carefully, kept it by itself well fed, with two or three bits of bark in the flower-pot; one day I had lost it, and could neither find pupa nor larva living or dead; I placed the chips of bark on the table, taking my magnifying-glass to look for the pupa; nothing could I see; when picking up the little bit of bark to put back in the pot it felt heavy; when I turned it up to see how it was, there was the pupa, snugly made up between a loose bit of chip and the inner side of the bark. The larva came off the same tree from which I got a male moth. I got hundreds of larvæ off the stitchwort, &c., by sweeping at night; nothing of note turned up, the best being *Plusia pulchrina.* Smoking with touch-paper was a good help, moths being driven down amongst the herbage by the rains. I saw many larvæ of *Eidophasia messingiella; Plusia interrogationis* was scarce.

One fine evening *Noctua neglecta* and *Cloantha solidaginis* were very busy on the flowers of the heather. *Nepticulæ* seemed scarce; the best species I took was *N. ulmivora*, a pair, in cop., on the aspen tree. *Elachista kilmunella* and *E. rhyncosporella* abounded in the bogs; so did *E. apicipunctella.* Another rather good species, *Laverna lacteella*, turned up; I gave an old stump a heavy knock, and off it came. I did not know my prize until it was set, but thought it was a small *Gelechia tricolorella.* *Thera firmata* were extremely fine in July; so were *Ellopia fasciaria* and *Macaria liturata.* In fact all the specimens of last year were larger than usual. I bred several *Polia chi* off *Genista tinctoria;* they are not of the pale type, nor yet the variety *olivacea*, but between the two. I also met with three *Lithocolletis* new to the district, viz., *L. vacciniella*, *L. corylifoliella*, and *L. scopariella;* the latter I think may prove a new species; it is nothing like my specimen of *L. scopariella.*

15, Spring Bank, Preston; February 24, 1880.

THE TORTRICES OF SURREY, KENT, AND SUSSEX.

By Walter P. Weston.

(Continued from p. 87.)

Grapholita ramella, Linn., = *Paykulliana*, Fab. — Not uncommon among birches in July and August. The larvæ are said to feed in the buds and young shoots of this tree, and should be looked for in April and May. This insect is widely distributed throughout these counties.

G. nisella, Linn. — A very variable species, but though generally distributed, it is not of common occurrence. The imago appears in July and August, and is generally to be obtained by beating. Wilkinson says:—"The larvæ are to be found in the catkins of sallows and poplars," and they should be looked for in March and April. I have on several occasions beaten the imago from dogwood (*Cornus sanguinea*) and maple (*Acer campestre*).

G. cinerana, Haw.—Is considered on the Continent as only a variety of the preceding species, and this opinion has been endorsed by Doubleday and Mr. C. G. Barrett. In the South of England *nisella* is the commoner, but at Rannock and other northern localities *cinerana* occurs abundantly. Curiously enough, none of the different varieties of *nisella* are to be met with there. The question of *cinerana* being a distinct species must be considered as still open. Wilkinson says:— "The imago appears in July and August, amongst poplars and aspens in the metropolitan district"; and it also occurs at Croydon, Darenth, and Folkestone.

G. nigromaculana, Haw.—Generally abundant among ragwort (*Senecio Jacobæa*) in July and August. The imago flies freely at dusk, and, from its whitish colour, is conspicuous on the wing. The larvæ are said to feed in the roots of ragwort. They are, however, occasionally to be met with in the stems, and I have also twice reared single examples from collected flower-heads of this plant.

G. subocellana, Donov., = *Campoliliana*, W. V.—Widely distributed throughout, and generally common among sallows. The imago appears in May and June, and specimens are also to be occasionally met with in July and August, but not in sufficient numbers to warrant the opinion that it is double-brooded. It may be obtained freely by beating. The larva feeds on the sallow in the autumn.

G. minutana, Hub. — A local species, but not uncommon where it occurs. The imago appears in July among black poplars (*Populus nigra*), and should be looked for in windy weather at rest on the trunks of the trees or on the sheltered side of any adjacent palings. The larvæ are to be found in May and June, feeding on the buds and young leaves of the black poplar, and preferring large trees. It has been taken at several places round London; Camberwell, Blackheath, and Wandsworth; also at Croydon and Wimbledon.

G. trimaculana, Don.—A very variable species, and abundant everywhere among elm (*Ulmus campestris*) in June and July. The larva is to be found in May feeding in the shoots and rolled-up leaves of the elm, and towards the end of the month the pupæ are to be found in numbers in the same situations.

G. Penkleriana, W. V.—Like the preceding species, is very variable, and also abundant everywhere among alder (*Alnus glutinosa*) and hazel (*Corylus avellana*) in June and July. The imago flies freely at dusk, and may also be readily obtained by beating. The larva is said to feed in the catkins of alder in March.

G. obtusana, Haw. — Not uncommon among oak (*Quercus robur*) and hazel. The imago appears towards the middle of May, and flies freely about an hour before sunset. It occurs at Lewisham, Darenth, near Strood, Tunbridge Wells, and Folkestone; Croydon, West Wickham, and Haslemere; also sparingly at Hastings.

G. nævana, Hub.—Abundant everywhere among holly (*Ilex aquifolium*), the imago appearing in August and September, while the larva may be found in plenty feeding in the young shoots in May and June.

G. geminana, Steph. — A local species, occurring among bilberry (*Vaccinium myrtillus*). The imago appears in June and July. It has occurred at a single locality in each of these counties, namely, Sevenoaks, near Caterham, and Mr. C. G. Barrett has recorded it from Haslemere. The larva feeds in the autumn and again in the spring, in the tops of the *Vaccinium*, drawing the leaves together. It is closely allied to the preceding species, but the anterior wings are narrower, and have a more silvery appearance. The perfect insects do not vary.

Phlæodes tetraquetrana, Haw.—Abundant everywhere among birch and alder in April and May. The imago flies freely in the afternoon and also at dusk. The larva is to be found on birch and alder in the autumn.

P. immundana, F. R.—Much scarcer than the preceding species, with which it sometimes occurs. It is also smaller, darker in colour, and the anterior wings are narrower. The imago appears among birch and alder in April, and again in September. The autumn brood is the scarcer, and the specimens are usually somewhat suffused with chocolate markings. It occurs at Lewisham, Darenth, Tunbridge Wells, Folkestone; Croydon, West Wickham; and Tilgate Forest.

P. demarniana, F. R.—Rather an uncommon species. The imago appears in May and June among birch. The larva is said to feed in the catkins in April. The localities are Darenth Wood, near Strood, Tunbridge Wells, Folkestone; Croydon, West Wickham; and Tilgate Forest.

P. crenana, Hub.—A single specimen is recorded by Mr. T. Blackburn (E. M. M., vol. v., p. 23), reared from a pupa obtained by himself when beating near Richmond. Otherwise it is essentially a northern species. Wilkinson says:—"The imago appears in March and April among sallows."

Hypermecia cruciana, Linn., = *excæcana*, H. S., = *viminana*, Guen., = *augustana*, Wilk. — A very variable species, and generally common among sallows, the imago appearing from June to August. The large grey examples with bright red markings are commoner among willows and the larger kinds of sallow, while examples reared from various kinds of dwarf sallow are more liable to produce grey or dark-coloured specimens. The larvæ feed in April and May in the sallow shoots, and are usually to be met with in plenty.

Batodes angustiorana, Haw.—Abundant everywhere in these counties. The imago appears in July and August, and the sexes are very dissimilar in colour and markings. The larva, which is polyphagous, is to be found in May and June, and is very partial to various fruit-trees, privet, &c.

(To be continued.)

COLEOPTERA IN 1879.

Captured by Thomas H. Hart.

During the past year my collecting has of necessity been limited to a very small area, and only on some two or three occasions have I been able to extend my search beyond the southern portion of the Ashford district. Consequently several localities where I have in other years taken good things have either not been visited at all, or else under circumstances that precluded the possibility of my turning the day to good account.

The Geodephaga I found remarkably scarce, some of those species that are usually most abundant being almost absent. In 1876 the pretty *Leistus spinibarbis* abounded to such an extent that it even invaded our dwellings. It was nothing uncommon on retiring to rest to find one capering across the bed, or climbing up the window-curtains. In the church, too, it was seen on more than one occasion mounted on the shoulder of one of the congregation, to the great amusement of the juveniles present. Last year I met with one specimen only. And as much may be said of numerous other common species.

One specimen of *Polystichus vittatus* occurred in a clay bank near where I had previously taken that species in a flood, but a close search for some time failed to produce more. *Badister peltatus* turned up again in the old spot, accompanied by *B. unipustulatus* and *Acupalpus consputus*.[*] *Dromius nigriventris* was taken in some numbers by beating thatch in November. I was much surprised at the locality, and also at the great variation in the markings of this insect. Several specimens of *Pterostichus picimanus* were washed out in a flood, but *P. inæqualis*, so abundant in 1877, was scarce last year.

The Brachelytra appeared to be more abundant, but I am hardly in a position to speak positively as to species. On July 29th, which was one of the few fine days the summer could boast of, a small Staph. (*Othius punctipennis* I believe) was flying in immense numbers about nine a.m. along the lee-side of the railway embankment adjoining my fields. I at first thought them ants, but approaching I found them to be Coleopterous.

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[*] Some years ago I was very much astonished at finding this insect in profusion in a similar locality at Litlington, near Cambridge.—J. A. Power.

The best of my Clavicornes were *Scydmænus fimetarius* (from a hot-bed), *Dendrophilus punctatus*, *Saprinus immundus* (from a dead rabbit along the coast), *Epuræa decemguttata*, *Cryptarcha imperialis*, *Cryptophagus populi*, and *Mycetophagus quadriguttatus*. Some of the flower-frequenters were unusually plentiful.

The Lamellicornes were generally scarce, *Melolontha vulgaris* and *Rhizotrogus solstitialis* being almost unobserved. The Onthophagi were fairly plentiful, but the Aphodii not nearly so abundant as usual.

Some species of Sternoxi were in profusion, such as *Lacon murinus*, *Corymbites holosericeus*, *Agriotes sputator*, and *A. lineatus*. The male of *Athous longicollis* was also plentiful, but the deceptive female was scarce, probably from being overlooked. The Telephori were fairly plentiful, and the commoner species of Malthodes and Dasytes were abundant. *Priobium castaneum*, *Anobium fulvicorne* (abundant on hop-poles), and *Xyletinus ater* (on oak-fences), were perhaps the best of this section. *Mordellistena abdominalis* occurred on one particular hawthorn bush, but though some dozens were seen it was so active as to prevent my bottling enough for a single row. *Abdera bifasciata* and *Phlœotrya Stephensi* are the only other species of Heteromera worth mentioning.

Of the Rhynchophora, *Platytarsus echinatus*, *Sitones cambricus*, *Orthochætes setiger*, *Plinthus caliginosus* (on clay lands), *Erirhinus festucæ*, *Sibynes primitus*, *Ceuthorhynchus echii*, *Ceuthorhynchideus horridus*, *Apion subulatum* (on *Lathyrus pratensis*), *Brachytarsus scabrosus*, *Bruchus lathyri* (*loti*, S. C.), and *Hylesinus oleiperda* were about the best. Weevils were not generally abundant; the *Orchestes alni*, *Ceuthorhynchus assimilis*, *C. quadridens*, and *Ceuthorhynchideus troglodytes* were in the greatest profusion.

Some of the Longicornes, as *Toxotus*, *Strangalia armata*, and *Grammoptera tabacicolor*, were abundant on Umbelliferæ. *Saperda populnea* could also be found in some numbers sitting on the aspen-leaves. *Leptura livida*, usually so plentiful, was not common.

The Phytophaga were, as regards certain species, the most numerously represented of the Order. Visiting a wood near here in search of *Zeugophora flavicollis*, towards the end of September, I found the aspens almost defoliated by *Lina tremulæ*. The insect literally abounded. On one plant of five short stems, the tallest being less than a foot and a half high, were thirty pupæ. Eleven had congregated under one leaf, and nine were attached to one stem. On another stem, about twenty-four inches high, were twenty-six imagos. The beetle was to be found in all stages, from a small larva to the perfect insect In another wood the aspen was severely attacked by *Phratora vitellinæ*, assisted by *Crepidodera helxines*, and on the chalk hills I found *Galeruca viburni* equally common on *Viburnum lantana*. My best captures were *Lema puncticollis*, *Phædon cochleariæ* (on water-cress), *Phratora cavifrons* (on aspen), *Crepidodera pubescens*, *Phyllotreta tetrastigma*, *Thyamis femoralis*, *Psylliodes attenuata* (on the hop-plant), and *Cassida nobilis* and *C. hemispherica*.

Amongst some things collected, and given to me unset by a friend, I found *Dermestes Frischii* and *D. undulatus*.

Kingsnorth, Ashford, February 12, 1880.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Amphysa prodromana.—I was glad to see the life-history of this species described by Mr. C. S. Gregson (Entom. xiii. 90). A few further notes may be interesting to some of the readers of the "Entomologist." It occurs in this district on the elevated moorlands at Staley-Brushes and elsewhere, near Manchester, in April. The male flies only during the late morning and early afternoon sunshine, and occurs amongst *Calluna vulgaris* and *Vaccinium myrtillus*, which plants I consider to be, probably, its natural food. Towards three or four o'clock they settle on the tips of the twigs, where also the females may be found, and not unfrequently *in cop.* Later in the day they fall off the twigs or creep down the stems amongst the dead leaves on the ground, and it is then a puzzle to find them. I have taken this species for a number of years, but never in such abundance as on the 21st of April, 1876, when I netted about seventy males, mostly worn, and, by searching on hands and knees, secured one hundred and thirteen females, mostly in very fine condition. From some of these I obtained a goodly number of batches of eggs, which I forwarded to correspondents whom I thought would be likely to rear it, but I have only heard from Mr. Gregson as being successful. Some years previously I had sent eggs and larvæ to the late Mr. R. S. Edleston, of Bowdon, but did not afterwards learn whether he succeeded in rearing them. The eggs I procured were deposited on the 21st to the 24th of April; those I kept for my own use began to hatch on the 15th of May. The larvæ seemed to take to anything I gave them, bilberry, coltsfoot, knotgrass, plantain, &c., and many of them made up in June on the coltsfoot leaves, and in the calico covering of the box, drawing together small folds by means of a web. The first imagos, two females, appeared on the 18th March following, and to the 3rd of April I had some thirty or forty specimens emerged, about two-thirds of them being females. From these I got eggs, which began to hatch on the 9th May, but owing to continued ill health Entomology lost its charms, and I had been compelled to break up my collection; so the larvæ were neglected, and consequently died. The species was somewhat local. I have since visited the locality where I took so many, and was sadly disappointed on finding the whole of the enclosure a complete wilderness of black burned heath, stems, &c., so the insect will be absent from this particular locality for a long time; it will be years before it can re-establish itself in such numbers as when I last met with it there. On the 26th March last (Good Friday) I visited the moors to try and find what I thought would be a suitable place to meet with the insect during the present month (April), but was unsuccessful, the moors were smoking and blazing away in a dozen or more places at once, and this continued all through the day. The burning of the vegetation of the moors, so destructive to insect life in all stages, is done I believe that it may spring up again young and fresh to afford nicer food for the moorgame (grouse), which birds are a great source of annoyance to entomological collectors. They are so very noisy if you chance to disturb them, with their loud whirr and plaintive cry, sounding like "go back, go back," which seems to remind you that you are committing serious trespass. The burning of the moors periodically, the grouse, and the keepers are great hindrances to our plentiful capture of *Amphysa prodromana* and other local species in this district.—JOHN S. WHITE; 15, Medlock Road, Droylsden, near Manchester, April 2, 1880.

DESCRIPTION OF THE LARVA OF CIDARIA FULVATA. — So far as I know there is no English description of the larva of this common species; it may therefore be advisable to publish one. My first acquaintance with it was on June 16th, 1877, when, on the occasion of an excursion of the Yorkshire Naturalists' Union to Sharlston, near Wakefield, I beat one out of a rose bush. Since then I have found it easily enough. Length about five-sixths of an inch, and of average bulk in proportion. Head rather narrower than the second segment; it has the lobes rounded, and when at rest appears to be notched on the crown: the notch, however, is really on the second segment, being formed by an extension of the skin into two prominences above the top of the head, and thus forming the notch. Body of nearly uniform width, rounded above and below, but the two portions divided by a wrinkled lateral ridge; the skin also has a wrinkled appearance, and the segments are very distinctly divided. Head and the ground colour of the body uniformly bright pale green; dorsal stripe composed of a double grey line; subdorsal lines of the same colour, but more boldly defined; a yellow margin forming the spiracular line extends along the lateral ridge; and the segmental divisions are also yellow. Ventral surface, legs, and prolegs bright pale green, the posterior segments yellower, and all the segmental divisions yellow. On the 25th of the same month the larva changed to a pupa amongst the leaves of its sprig of rose; this was about three-eighths of an inch long, the colour almost uniformly of a dull green. From it an imago emerged on the 13th of the following month.—GEO. T. PORRITT; Highroyd House, Huddersfield.

SMERINTHUS POPULI (hermaphrodites).—Amongst a number of *S. populi* I am now rearing from pupæ, I find two hermaphrodite specimens having each a male and female antenna. One of these is depositing eggs.—EDMUND SHUTTLEWORTH; 59, Charlotte Street, Portland Place, W., April 16, 1880.

CAPTURES AT TORQUAY.—During March I searched for larvæ of *Stilbia anomala* and *Heliophobus hispida*, for the first time this year, expecting to find them nearly full fed and in some abundance. I was greatly mistaken, for we only found one

S. anomala and not more than ten *H. hispida*, none of them being more than half fed. The larvæ of *Agrotis lucernea* were also very scarce, but they were most of them nearly full fed. *Epunda lichenea* and *E. nigra* were in more abundance than any of the above-mentioned larvæ; but they were very small, the *E. nigra* evidently having only just turned out from the ova. The larvæ of *Triphæna fimbria* and *Noctua glareosa* were more abundant than usual. The sallow bloom this year, here, has been very much spoilt by the rain, but yielded plenty of common moths, such as *Tæniocampa gothica*, *T. stabilis*, *T. cruda*, and one *Trachea piniperda*. On 13th April we got a fine pair of *Arctia fuliginosa* which must have only just emerged from the pupa.—Charles Winn; Kettlethorpe Hall, Wakefield.

OBITUARY.

Dr. Samuel Constant Snellen van Vollenhoven.—Science has just suffered a great loss by the death of Dr. Samuel Constant Snellen van Vollenhoven, who died at the Hague, on the 22nd of March last. This well-known naturalist was born at Rotterdam on the 18th of October, 1816. After taking his degree at the University of Leyden, he went to reside at the Hague, with the intention of practising at the bar. This career, however, seemed to have but little attraction for the young barrister, who had from his early youth shown a very decided taste for the study of natural science. After a two years' residence at Leyden, he took up his residence in the country, at Glephawe, near Heemstede, and devoted himself more especially to the study of insects, a catalogue of Netherland Coleoptera being the first fruit of his work in this direction. On the establishment of the Netherland Entomological Society, in 1845, he became one of its first members, and in 1852 he was elected its president, which office he retained, with a short interval, up to the time of his death; and it may be said that the high position occupied by this society, both in the Netherlands and abroad, and the value attached to its Transactions, are in a great measure due to the exertions of its late president. In former years the whole of the collection of Invertebrata in the Museum of Natural History at Leyden was placed under the care of one person, but in the year 1854 it was resolved to appoint a separate curator for the entomological department, and Dr. Snellen van Vollenhoven was appointed to the post. He retained this appointment for nineteen years, and they who have had the opportunity of inspecting the treasures of that collection will be best able to testify to the value of the labours of its late curator. Unfortunately, in the year 1873, the state of his health obliged him to relinquish this post. Dr. Snellen van Vollenhoven was the author of numerous scientific works on Entomology: these were nearly all illustrated by plates of great excellence from his own drawings. Among his principal works may be mentioned:—'Hemiptera-Heteroptera Neerlandica,' 'Essai d'une faune Entomologique de l'Archipel Indoneerlandais,' 'Schetsen ten gebruike, bij de Studie der Hymenoptera,' and 'Pinacographia,' the latter work, of which but eight parts appeared, being an illustrated description of the Ichneumons of North-West Europe. To these were added numerous important papers in the Transactions of the Netherland Entomological Society, and contributions to the continuation of Sepp's well-known work on the butterflies of the Netherlands, which he edited up to the time of his death. His life-histories of sawflies are well known to British entomologists, a considerable part of this work having been translated in the pages of this periodical. Among entomological works of a more popular character may be mentioned his 'Gelede dieren san Nederland, and a volume on the metamorphoses of insects. His last work was a biography of P. Lyonet, which appeared last year in the 'Album der Natuur.'—J. W. M.

Besides the lamented Dr. van Vollenhoven we regret to notice the deaths of the following eminent entomologists:—

Leopold Kirchner, the Bohemian hymenopterist, died at Kaplitz on the 29th of last December. He was the author of the 'Catalogus Hymenopterum Europæ,' which was issued under the auspices of the Vienna Natural History Society. The necessity for this work is shown by its being already out of print, although only published in 1867. Its use, however, would have been greater if it had been more carefully compiled, as in many families it is a mere alphabetical list of used names, without any attention to synonymy; obsolete and duplicate genera also frequently find a place. Records of parasitism and geographical distribution of the species are attempted, but not much progress is made. Kirchner wrote a list of the Hymenoptera of his district, published in the 'Verhandlungen' for 1854, and "The galls of the Budweiss district" appeared in the Prague 'Lotos' for 1855. Kirchner practised as a Doctor of Medicine at Kaplitz, and as he received his diploma (Vienna) in 1830 he must have attained the allotted three score years and ten.

JEAN-BAPTISTE ALPHONSE DECHAUFFOUR DE BOISDUVAL died the day after Kirchner (December 30th). He also was a Doctor of Medicine, and an eminent and veteran entomologist. Being born in Normandy, where he also died, at Ticheville, near Vimoutiers, in the last year of the last century, he thus outlived the allotted term by ten years. Dr. Boisduval was known here almost exclusively as a lepidopterist; but in earlier life he seems to have paid some attention to Coleoptera, and allied himself both with Lacordaire (1835) and Dejean (1833) in their respective publications on that Order. As a lepidopterist, Boisduval is well known as the author of many valuable works and memoirs. The latter were mostly published in the French 'Annales,' though three of his later memoirs appeared in the 'Annales' of the Belgian Entomological Society. Of both of these societies he was an honorary member; of the Belgian since 1860; and of the French since 1866. He was an original member (1831) of the French Society, and was also a member of the Botanical Society of France, and of the Horticultural Society of Paris. Of Boisduval's works three are tolerably well-known in this country: they are his 'Genera et Index methodicus' (1840); the 'Collection iconographique et historique des Chenilles d'Europe' (1832—1837), by Boisduval, Rambur, and Graslin; and the 'Species général des Lépidoptères' (1836—1874) by Boisduval and Guenée. In Dr. Boisduval, the friend of the illustrious Latreille, who died in 1833, we lose a valuable link with the past.

ETIENNE BERCE also died, at the age of seventy-seven, on December 29th last. Berce was a student of both Coleoptera and Lepidoptera, and is well known as the author of several French works on Lepidoptera; especially of that part of the French fauna, four volumes published from 1867 to 1871, which contain forty-nine coloured plates. This work is spoken of by 'Le

Naturaliste' as "l'œuvre la plus complète et la plus consciencieuse qui ait été imprimée sur ce sujet." He was elected a member of the French Entomological Society in 1835, and was a frequent contributor to its 'Annales.'

J. S. KNATECK, of Berlin, the Enghadine collector, mentioned by Stainton, died at Sils-Maria on 26th January last, aged seventy-nine years. See Ent. Nach., vi., 61.

ERNST AUGUST HELLMUTH VON KIESENWETTER, of Dresden, the eminent coleopterist, has been carried off in the sixtieth year of his age. He contributed many important articles to the various German and French entomological serials, dating as far back as 1842. Several of these memoirs were monographs of genera, e. g., *Hydræna, Heterocerus, Malthinus*, &c. Von Kiesenwetter was one of the four authors of the 'Naturgeschichte der Insecten Deutschlands: Coleoptera.' He was a Privy Councillor of the King of Saxony.

DR. JOHANN GEORG HAAG-RUTENBERG, the Frankfort coleopterist, died on 20th November, 1879, aged forty-nine years. George Haag was the author of many papers in the Berlin 'Zeitschrift' and Stettin 'Zeitung'; his revision of the *Cantharidæ* (S. e. Z., xl., 249—275, 287—314, 513—519) remains unfinished. See Stett. ent. Zeit., xli., 111.

CAMILLO RONDANI, the eminent dipterist, died last autumn, 18th September, 1879, at Parma, his native city, where he was president of the "Instituto Tecnico." He published many memoirs on Diptera, both European and exotic, but has left his great work 'Dipterologiæ Italicæ prodromus' unfinished, eight volumes having, however, appeared (1856—1877). He was vice-president under Targioni-Tozzetti, and an original member (1869), of the Italian Entomological Society, in whose 'Bullettino' he published many various memoirs, notably his "Degli insetti parassiti" in volumes three to eight. Also, as in other serials, many papers on the various families of Diptera. He was seventy-two years old when he died.

The loss of these honoured entomologists will be felt by students of almost every Order of Insects; but let us hope that some of our readers are qualifying to stop the gaps thus left.—E. A. F.

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LOCALITIES FOR BEGINNERS.

By John T. Carrington, F.L.S.

No. VII.—PINNER.

Some thirteen or fourteen miles north-west of London, a little beyond classical Harrow, on the London and North Western Railway, is Pinner Station, which may be reached by frequent trains from Euston Station.

Leaving the railway we take the road west of the station, and shortly pass the "Railway" Inn. To our right, in the distance, we see some wooded hills. Our business is to try and find out what insects those woods produce. Following the road, we come in about ten minutes to a park paling, enclosing a park with an old moat in it. By the sides of the moat are some alders. This park fence is about a mile in extent, but only a part of it stands in our direct road. It is overhung with wych elms, beech, oak, firs, &c. With a suitable wind and a dull morning this fence will repay the time spent in examining it for Lepidoptera at rest thereon. Following it round brings us to Moss Lane, a nice old bye-lane, good for Geometers, &c., which may be taken at dusk, or disturbed with the beating-stick during the daytime. It is not now our intention to go all the way round, but to continue the road by which we came. Passing a guide-post on our left we shortly come to the end of Waxwell Lane, which may be known by a few lime trees around a well. Opposite is a cottage, with a gate to the left. Passing over the stile here we follow the path by the tall hedge on our right. If it be in its season, we may find the webs of *Eriogaster lanestris* larvæ, often in abundance.

We come, at the end of the hedge, to some isolated oaks, good for pupæ digging. At the roots we are pretty well sure to find pupæ of *Agriopis aprilina* about the end of July. In the fields to the left, which are upon a subsoil of chalk, we may get the two blues which frequent such places, *Lycæna Adonis* and *L. Corydon.* We now cross a field and join a broader path. On the left here are more isolated oaks. Opposite these oaks we must be careful not to miss the little white gate to the right, which leads us through Pinner Hall farmyard. We take our way through a gate between some buildings, and so follow the path until we come to a little coppice on our right. Here may often be heard the sweet warble of the nightingale as we pass; but we must not delay here, for we can better spend our time farther on. Passing two or three fields surrounded with fine tall old hedges, which are quite a characteristic of the neighbourhood, we come to Oxhey Lane. The path we have been following is one leading from Pinner to Watford; it here crosses the lane, but we will now leave it and turn to our left up the lane towards the woods, which we see now within a few minutes' direct walk. It will, however, take us longer to get up to them, for we are now in one of the most entomological-looking lanes in the district. Numbers of oak trees, three or four deep, growing in a coppice on each side of the road, make this a most likely and convenient place for sugaring. Amongst the plants and shrubs are *Stachys*, *Angelica*, *Galium*, *Lychnis diurna*, stitchwort (*Stellaria holostea*), wild roses, honeysuckle, dogwood, maple, and many others. When we get to the top of the lane we find a gate leading into the wood. Before entering we see on each side rough fields, in which may be taken *Argynnis Paphia*, *A. Aglaia*, *A. Adippe*, *A. Euphrosyne*, and *A. Selene.* Besides these are the common day-flying moths, with plenty of Tortrices and Tineina.

The wood we are now entering is Oxhey Wood; Pinner Woods are to the left. I will give a short description of these woods, which will serve for the whole, which are of very considerable extent, and are all adjoining. The trees are chiefly oaks, which are some fifty or sixty years old; but the undergrowth is very varied, both in species of shrubs and plants and in age, according to the part of the wood where we may be. This undergrowth seems to be periodically cleared in patches, leaving only the large trees standing. It consists of sallow, birch, bramble, hazel, poplar, wild cherry, dogwood, ash, dewberry (*Rubus cæsius*), &c. In spring the cleared portions present a very beautiful appearance. Blue with wild hyacinths (*Endymion nutans*) and common bugle (*Ajuga reptans*), these are mixed with wood spurge (*Euphorbia amygdaloides*), dwarf honeysuckle, common ferns, and beautiful patches of the lovely little germander speedwell (*Veronica Chamædrys*)—

> "Not for thy azure tint, though bright,
> Nor form so elegantly light,
> I single thee, thou lovely flower,
> From others of the sylvan bower.
> Thy name alone is like a spell,
> And whispers love in 'Speed thee well.'"

In May and June a sharp look-out should be kept for the large clear-winged moths, *Macroglossa fuciformis* and *M. bombyliformis*, feeding on the bugle flowers. The latter is less likely to occur than the former, although the food of its larvæ, the devil's-bit scabious (*Scabiosa succisa*), grows plentifully in places.

Returning to the gate, through which we have just entered the wood, we pass along the broad path, noting the fine sugaring ground this would make; in fact, the whole wood seems most suitable for sugaring. A dozen or twenty entomologists could sugar with comfort at one time in these woods, and barely see one another during the evening. We shortly come to a fairly good road, which runs through the wood at right angles north and south. This road leads to Oxhey Hall, and on to Watford. This and other roads are marked, "No thoroughfare," but I do not think there is any difficulty in using them; at least, a keeper whom I met one day this week made no remark, but looked as though he had never before seen a butterfly net.

To the right of where we join this road is a fine stretch of woodland, with some larch and spruce firs in one corner, and a quantity of dwarf hornbeam farther on. I will now leave the entomologist to wander at his will, and to catch all he can until tired, when he must meet me again at the point where we parted, by the corner of the field which is cleared in the wood. We will now make our way by another route towards the station; it is by turning to the south along this road through the wood. In about a quarter of an hour it brings us clear of the Pinner Woods through a high gate, with a cottage to the right and a lodge to the left of us as we emerge.

We cannot well leave this spot without for a moment stopping to admire the beautiful view. High in front of us is the broad valley of the Thames, with "fair Middlesex" at our feet; this is backed by the Surrey hills, some twenty-five miles away in the distance. One of the first objects which catches the eye is a large sheet of water a couple of miles to the right of where we stand. This is Ruislip Reservoir, which belongs to the Regent's Canal Company. It is about eighty acres in extent, and is surrounded by Ruislip Woods, which seem so extensive that we resolve some day to explore them.

The lane to our right leads back to another part of the woods, where, I hear, the bilberry grows; but we must leave that for another day, and go down the hill where the road dips between high banks and hedges, which should be well examined for Tortrices in summer. A little farther on I had this week the pleasure of finding the larvæ of *Ebulea stachydalis*, one of our rarest Pyralides, feeding on the foul-smelling woundwort (*Stachys sylvatica*), which grows in little patches in the hedges on each side of the road. This would indicate the possibility of two broods annually of that lepidopteron.

At the bottom of the hill is a guide-post, and opposite to our right is a lane with whitethorn hedges of great size, quite twenty feet in height. From these the larvæ of several Tortrices may be beaten, as well as that of *Eupithecia exiguata*. Returning to the guide-post, up the Pinner lane, we see to the left a considerable wood of larch, spruce, Scotch fir, &c. This should be tried if time permits. Continuing along this lane brings us to the high road which we left in the morning from the station. But we turn a short distance to the right to the "Bell" Inn for refreshment before starting for the station, which is about a twenty minutes' walk away.

The district I have just described seems to have been little visited by London, or indeed any, entomologists. I made frequent inquiries if butterfly-catchers ever came that way, but none of the residents had ever seen them. A policeman volunteered that he had never seen one, but frequently "bird-catchers," whom, he said, came from Uxbridge. To him the two pursuits seemed much akin, and he seemed to look upon either with the same amount of respect.

The soil of the neighbourhood is light clay, gravel, and sand, with a subsoil of chalk, which here and there comes close to the top, when the plants peculiar to that formation show themselves, the traveller's joy (*Clematis*) being one of these. The country is undulating, and in places decidedly pretty, affording some nice sunny slopes, on which good collecting may be expected.

I have not enumerated a list of the Lepidoptera taken in the Pinner district for the simple reason that, so far as I can find, it has been little worked. I am told that some years ago the following butterflies were taken in the woods:—*Apatura Iris, Thecla quercus, T. betulæ,* five species of the genus *Argynnis*, several *Vanessidæ, Limenitis Sibylla, Arge Galathea,* &c. Amongst moths, where the wood spurge is common, *Minoa euphorbiata* is sometimes abundant. I saw myself, on a recent visit, amongst other species, *Cidaria silaceata*, which I should expect to find, on a favourable day, in some numbers, for the food of its larva (*Epilobium*), is common over the whole woods. I much wonder that so fine a district, which is so comparatively close to London, has been so little worked; but I hope before long to receive, for this magazine, from some of our readers a good account of work done there.

Royal Aquarium, Westminster, S.W., May 22, 1880.

A CONTRIBUTION TOWARDS A LIST OF IRISH SPIDERS.

By Thomas Workman.

From the time that Dr. Templeton, in the first quarter of the present century, collected and described several species of Irish spiders, the results of which are embodied in Mr. Blackwall's well-known work, 'The Spiders of Great Britain and Ireland,' there seems to have been no observer until the Rev. O. P. Cambridge, to whom I owe a deep debt of gratitude, asked me to collect for him in the spring of 1877.

Working as steadily as circumstances would permit from that time until now, I have been able to add considerably to the number of known species.

Mr. Blackwall enumerates forty-three species as found in Ireland; and Mr. Cambridge, in his work just published, 'The Spiders of Dorset,' gives three more, so that, with the sixty-five species that I have found, one hundred and eleven is the total number of our Irish species so far as known.

It is probable that one collecting in the South or West of Ireland would be rewarded for his labour by a more numerous list of species than is to be found in the more northerly parts, and more especially if one considers that the species already found in Great Britain amount to upwards of five hundred.

It may be remarked that there is considerable doubt about some of Dr. Templeton's species, as the types were deposited by that gentleman in the Belfast Museum, and have long since disappeared.

For the preservation of spiders in the cabinet, I of course use spirits of wine, but place my specimens in flattened phials, in which the spider appears to better advantage, though not quite so convenient for taking out and examining as by Mr. Cambridge's method of test-tubes, stopped with a pledget of cotton, and then placed in stoppered bottles with spirits of wine.

In the following list, I have adopted the classification as given by Mr. Cambridge. It contains all the species, as far as I can find, that have been observed in Ireland; and nearly all are from the neighbourhood of Belfast, in the counties of Antrim and Down.

Only two appear to be new to science, namely, *Erigone improba*, Camb., and *Linyphia subnigripes*, Camb., though some are rare in England, and I believe the two species of *Dysdera; D. Cambridgii*, Thor., and *D. crocata*, C. Koch, have not hitherto been found in Scotland.

Class ARACHNIDA.

Order ARANEIDEA.

Fam. DYSDERIDES.

Genus DYSDERA.

Dysdera Cambridgii, Thor. Glenarm; Eden, Carrickfergus.
D. crocata, C. Koch. Kircubbin, Co. Down.

Genus HARPACTES, *Templ.*

Harpactes Hombergii, Scop. Generally distributed, but not plentiful.

Genus SEGESTRIA, *Latr.*

Segestria senoculata, Linn. Everywhere under stones, &c.

Genus OONOPS, *Templ.*

Oonops pulcher, Templ. Not uncommon in fir trees and course grass near the sea.

Fam. DRASSIDES.

Genus PROSTHESIMA.

Prosthesima Petiverii, Scop. Near Dublin. By Dr. Templeton.
P. nigrita, Fab. Sand-hills, Giant's Causeway.

Genus DRASSUS, *Walck.*

Drassus lapidicolens, Walck. Everywhere under stones.
D. ? ferrugineus, Bl. Ireland. On authority of Blackwall.
D. cupreus, Bl. Ireland. On authority of Blackwall.

Genus CLUBIONA, *Latr.*

Clubiona comta, C. Koch. Sparingly under fir trees; Colin Glen, Belvoir Park, and Stranmillis.
C. neglecta, Camb. Under stones; Islandmagee; Black Mountain?
C. reclusa, Camb. In low bushes; Colin Glen.
C. pallens, C. Koch. Colin Glen.
C. holosericea, De Geer. Belfast; Glenarm.
C. terrestris, West. Ireland; Islandmagee? On authority of Blackwall.
C. ? formosa, Templ. Ireland. On authority of Blackwall.

Genus AGROECA, *Westr.*

Agroeca proxima ? Camb. One specimen at Cave Hill.

Fam. DICTYNIDES.

Genus DICTYNA, Sund.

Dictyna uncinata, West. One specimen; Belfast.

Genus AMAUROBIUS, *C. Koch.*

Amaurobius fenestralis, Strorm. Everywhere.
A. similis, Bl. Outhouses.
A. ferox, Walck. Near Dublin. By Dr. Templeton.

Fam. AGELENIDES.

Genus ARGYRONETA, *Latr.*

Argyroneta aquatica, Clerck. Lurgan demesne.

Genus CRYPHŒCA, *Thor.*

Cryphœca silvicola, C. Koch. Colin Glen.

Genus TEGENARIA, *Latr.*

Tegenaria atrica, C. Koch. Near Dublin. By Dr. Templeton.
T. Derhamii, Scop. Common.

Genus TEXTRIX.

Textrix denticulata, Oliv. Giant's Causeway, under stones.

Genus AGELENA.

Agelena labyrinthica, Clerck. Ireland. On authority of Blackwall.
A. ? Hyndmanii, Templ. Ireland. On authority of Blackwall.

Fam. THERIDIIDES.

Genus PHILCOMMUM, *Thor.*

Pholcomma gibbum, Westr. One specimen, female. Colin Glen.

Genus THERIDION, *Walck.*

Theridion tepidariorum, C. Koch. Common in greenhouses.
T. sisyphium, Clerck. Common.
T. denticulatum ? Walck. Windsor, Belfast.
T. varians, Hahn. ?
T. simile, C. Koch. ?
T. rufolineatum, Luc. ?
T. pulchellum, Walck. ?
T. bimaculatum, Linn. ?
T. pallens, Bl. Belvoir Park.
T. ? auratum ? Templ. On authority of Blackwall.

Genus PHYLLONETHIS, *Thor.*

Phyllonethis lineata, Clerck. Common.

Genus STEATODA, *Sund.*

Steatoda ? hæmatostigma, Templ. On authority of Blackwall.

Genus ERIGONE, *Sav.*

Erigone longipalpis, Sund. Glastry, Co. Down.
E. promiscua, Camb. Islandmagee.
E. dentipalpis, Reuss-Wid. Giant's Causeway.
E. rubens, Bl. Colin Glen, Belvoir Park.
E. isabellina, C. Koch. Colin Glen, Belvoir Park.
E. Huthwaitii, Camb. Glastry, Co. Down.
E. improba, Camb. Belfast.
E. bituberculata, Reuss-Wid. Belfast.
E. livida, Bl. Islandmagee, under stones.
E. rufipes, Sund. Potavoe.
E. albipunctata, Camb. ?
E. fuscipalpis, C. Koch. ?
E. agrestis, Bl. Ireland. On authority of Rev. O. P. Cambridge.
E. retusa, West. Ireland. On authority of Rev. O. P. Cambridge.
E. Sundevallii, West. Ireland. On authority of Rev. O. P. Cambridge.
E. ? pilosa, Templ. On authority of Blackwall.
E. ? pallidula, Templ. On authority of Blackwall.
E. ? carinata, Templ. On authority of Blackwall.

Genus WALCKENÆRA, Bl.

Walckenæra bifrons, Bl. One male among stones; Islandmagee.
W. erythropus, West. Two or three specimens, males; Kircubbin and Islandmagee.
W. permixta, Camb. Portavoe.

Genus PACHYGNATHA, *Sund.*

Pachygnatha Clerckii, Sund. One specimen, Colin Glen; three, Belvoir Park.
P. Listerii, Sund. On authority of Blackwall.
P. Degeerii, Sund. Common under stones, &c.

Genus LINYPHIA, *Latr.*

Linyphia thoracica, Reuss-Wid. Colin Glen, Islandmagee, Marlborough Park.

Linyphia leprosa, Ohl. Islandmagee, Portballintrae.
L. minuta, Bl. Stranmillis, Colin Glen, Islandmagee
L. subnigripes, Camb. Female; Windsor, Belfast.
L. luteola, Bl. Colin Glen.
L. nigrina, West. Colin Glen, Belvoir Park.
L. pullata, Camb. ?
L. dorsalis, Reuss-Wid. Portballintrae, Marlborough Park.
L. circumspecta, Bl. Islandmagee.
L. bicolor, Bl. Colin Glen, Islandmagee.
L. cristata, Menge. Stranmillis, Colin Glen.
L. parvula, West. Islandmagee.
L. concolor, Reuss-Wid. Islandmagee.
L. insignis, Bl. Belvoir Park.
L. clathrata, Sund. Colin Glen.
L. zebrina, Menge. Colin Glen, Islandmagee.
L. triangularis, Clerck. Common; Colin Glen, Islandmagee.
L. montana, Clerck. Belvoir Park.
L. pusilla, Sund. Colin Glen, Islandmagee.
L. hortensis, Sund. Kircubbin
L. ? nasata, Templ. Cranmore.

Genus Ero, *C. Koch.*

Ero thoracica, Reuss-Wid. Colin Glen.

Fam. Epeirides.

Genus Meta, *C. Koch.*

Meta segmentata, Clerck. Very common.
M. Merianæ, Scop. Not so common; Portballintrae, Islandmagee.

Genus Tetragnatha, *Latr.*

Tetragnatha extensa, Linn. Very common.

Genus Zilla, *C. Koch.*

Zilla x-notata, Clerck. Common.
Z. atrica, C. Koch. Common in Colin Glen in Autumn.

Genus Epeira, *Walck.*

Epeira cucurbitina, Clerck. Not uncommon at Glenarm.
E. diademata, Clerck. Very common.
E. cornuta, Clerck. Portballintrae, Kircubbin.
E. quadrata, Clerck. Co. Kerry.

Fam. Thomisides.

Genus Xysticus, *C. Koch.*

Xysticus cristatus, Clerck. Common under stones.

Genus Oxypetala, *Sim.*

Oxypetala horticola, C. Koch. One specimen; Colin Glen.

Genus Philodromus, *Walck.*

Philodromus aureolus, Clerck. Stranmillis.

Fam. LYCOSIDES.

Genus PIRATA, *Sund.*

Pirata piraticus, Clerck.

Genus TROCHOSA, *C. Koch.*

Trochosa picta, Hahn. On sand-hills near sea, Giant's Causeway, Portavogie.
T. ruricola, De Geer. Common under stones.
T. terricola, Thor. Common under stones.

Genus LYCOSA, *Latr.*

Lycosa annulata, Clerck. Very common on old pasture-land.
L. pullata, Clerck. Islandmagee.
L. nigriceps, Thor. Islandmagee.
L. palustris, Linn. Islandmagee, Belfast Harbour.

Genus TARENTULA.

Tarentula pulverulenta, Clerck. Co. Kerry, Islandmagee.

Fam. SALTICIDES.

Genus EPIBLEMUM.

Epiblemum scenicum, Clerck. Near Dublin. By Dr. Templeton.

Genus HELIOPHANUS, *C. Koch.*

Heliophanus cupreus, Walck. Portballintrae, island in Strangford Lough.

Mr. Cambridge, in his work already referred to, says that *Amamobius similis*, Bl., found so abundantly in England, has not yet been observed on the Continent; but I have within the last few days seen specimens found near Hamburg, where Mr. Bösenberg says it is not uncommon.

Bedford Street, Belfast, May 3, 1880.

THE TORTRICES OF SURREY, KENT, AND SUSSEX.

By WALTER P. WESTON.

(Continued from p. 112.)

Pædisca bilunana, Haw.—Common everywhere among birches, and generally distributed. The imago appears in June, and is to be reared from catkins collected in March and April.

P. oppressana, Treit.—A local and uncommon species. The imago occurs in June, and is usually to be met with on the trunks of Lombardy poplars, in the bark of which the larva feeds. The species has occurred at Willesden and Folkestone.

P. corticana, W. V.—Abundant everywhere among oaks in July and August. The imago varies from drab to black, including green, olive, and fuscous forms. The larva feeds on the oak.

P. profundana, W. V.—Distributed throughout among oaks, but not so common as the preceding species. The imago appears in July and August, and is very variable. The larva is to be met with in May and June.

P. opthalmicana, Hüb.—An uncommon species; the imago appearing in August and September among poplars and aspens. It has occurred in each of these counties, but the localities are limited: Strood, Folkestone; Lewes; Croydon and Wimbledon.

P. occultana, Doug.—Local and rare in these counties. It has occurred at Birch Wood; Brighton; and near Weybridge. The imago appears in June and July, and is to be met with among larch and fir trees.

P. solandriana, Linn.—Common throughout. The imago appears in July and August, and may readily be obtained by beating. The larva feeds on birch, hazel, and I have found it commonly on *Cornus sanguinea*. It is a variable species, but yet constant in its variations.

P. semifuscana, Haw.—Widely distributed throughout among sallows; the imago appearing from July to October, and may be taken on the wing at dusk, and also at light. The larva feeds on the sallow in June. This species may be distinguished from *P. solandriana* and *P. sordidana* by its more shining appearance, and the silvery whitish colour of its hind wings.

P. sordidana, Hub., = *stabilana*, Steph.—Distributed, but local. The imago is of a dull brown colour, and more constant than either of the preceding species. It appears in September and October, and is not uncommon among alders, upon which the larva feeds.

Ephippiphora bimaculana, Don.—Distributed and not uncommon among birches, especially in heathy places. The imago appears from July to September. The larva is to be found in the shoots in the spring.

E. cirsiana, Zell.—Not uncommon among thistles in marshy places, and generally distributed. The imago appears in June and July, and may be captured on the wing at dusk, but it is not a free flyer. The larva feeds in the stems of thistles (*Carduus palustris*), and also of *Centaurea nigra*, in the autumn and following spring.

Both the larva and imago of this insect are very similar to the following species, but rather smaller; the imago is also darker, and later in appearance.

E. pflugiana, Haw., = *sticticana*, Steph., = *scutulana*, Wilk. —Much commoner than the preceding species. The imago appears in May and June among thistles, in the stems of which the larva feeds. Its habits are similar to those of the preceding species.

E. Brunnichiana, W. V.—Abundant throughout, wherever its food-plant, coltsfoot (*Tussilago farfara*), occurs. The imago appears from the end of May to August. The larva feeds in the flower-stems of the coltsfoot in the early spring.

E. fœneana, Linn.—Local, but not uncommon where it occurs. The larva feeds in the autumn and following spring in the roots of mugwort (*Artemisia vulgaris*); and the imago is to be met with in June and July. It occurs along the Kentish bank of the Thames; also at Darenth.

E. nigricostana, Haw.—A local and uncommon species. The imago appears in June and July among hedge woundwort (*Stachys sylvatica*), and may be taken on the wing in the afternoon. The larva feeds in the autumn and following spring in the roots of that plant. The insect has been taken near Hastings; Haslemere, Croydon, Wimbledon, Epsom; Lewisham, Darenth, and Folkestone.

E. signatana, Doug.—Local and uncommon. The imago appears in June and July, and flies somewhat freely at dusk among sloe, *Prunus spinosa;* and it is also said to feed on the wild cherry, *P. padus.* Its capture is recorded from Croydon, Sanderstead, Mickleham; Folkestone, Dover, and Strood. It also occurs at Box Hill, and near Lewes.

E. trigeminana, Steph. — Somewhat local, but generally abundant where it occurs. The imago appears in June and July, and prefers railway slopes and rough broken ground. The larva is said to feed on ragwort (*Senecio Jacobæa*). The imago is common at Croydon, Epsom Downs, Box Hill; Tilgate, Lewes, Hastings; Folkestone, Dover, Strood, and Darenth.

E. tetragonana, Steph.—Local and scarce. The imago appears in July, and should be looked for in the open rides in woods and woody lanes. According to Wilkinson, the larva may be found in the autumn full-fed under moss on beech trees; it hybernates and goes into pupa in the spring; but Mr. C. G. Barrett is of opinion that the black briony (*Tamus communis*) is its food-plant, for he has always found it amongst that plant. The species has occurred at Haslemere; Tilgate Forest; Folkestone, and in North Kent.

E. populana, Fabr.—An uncommon species. The imago appears in July and August among sallows and also blackthorn. The larva feeds in the shoots in May. It has occurred at Darenth, Folkestone; Haslemere, and Croydon.

E. obscurana, Steph., = *gallicolana*, Zell.—Local and rare. The imago appears in May and June, flying round oaks at dusk, and always high. This species may be bred from oak-galls, especially those of *Cynips Kollari* collected in the autumn. It has occurred at Croydon; Darenth; and Tilgate Forest.

E. ravulana, H.-S.—Local and rare. The imago appears in May and June, and flies somewhat freely in the afternoon sunshine. The larva has not yet been discovered. The species was added to our list in 1866, from specimens captured by Mr. E. G. Meek at Darenth; it has occurred several times since in that locality, and has also been taken at Tilgate Forest and Folkestone.

(To be continued.)

URANIA SLOANUS AT HOME.

By P. H. Gosse, F.R.S.

Notices of the rarer exotic Lepidoptera, as they appear at home, are not so abundant but that your readers may be pleased to peruse some pen-pictures of the lovely *Urania Sloanus* in its vernal swarming in the Island of Jamaica. Thirty-five years have passed since I was charmed with the gorgeous sight, and I essayed to describe what I had seen in my 'Naturalist's Sojourn in Jamaica,' pp. 69—74. Thirty-five years! 'tis a long time!—

> "I ask, Is the nightingale singing there yet?
> Are the roses still bright by the calm Bendemeer?"

Are the *Uraniæ* still glittering in livery of green and crimson and gold in the grand forests of Jamaica? Let me answer in the words of my esteemed correspondents, the Rev. J. L. Mais and his son, who are sending not only specimens of the charming butterflies of the island for my cabinets, but valuable notices of their life-histories in a series of letters, from which I propose to make a few extracts.

My young friend writes from Walton, Jamaica, on the 9th of March last:—"We have seen several *Uraniæ*, but all feeding high out of reach. Yesterday, between 5 and 6 p.m., I saw a striking scene: a tree covered with snow-white blossoms, on which swarms of this beautiful insect, and several black and emerald males of the long-tailed humming bird (*Trochilus Polytmus*), were feeding and playing at the same time; the two beauties — the insect and the bird — darting about in all directions, and sucking the white flowers together; a lovely sight, and one never to be forgotten."

A month later the same observer, sending me a consignment of this charming butterfly-moth, in fine condition (now in the hands of Mr. Marsden, Gloucester), remarks:—"The *Uraniæ* have all been caught within the last fortnight, and so are quite fresh. We caught them feeding on the mango blossom, which just now is in great profusion. . . . It was very interesting, last week, to watch these brilliant creatures hovering round the great dense mango trees, now and then alighting on a flower, and looking, as they projected the long sucking tongue into the corolla, as if they were attached to it by a slender wire. This was in the early day; as soon as the sun became hot, *viz.*, about 10 or 11 a.m., they would pitch on the upper surfaces of selected leaves, always turning head downward, the wings expanded as if in a cabinet; while a few would gaily chase each other around the trees at a height of only a few feet from the ground."

Still more recently Mr. Mais, senior, conveys to me his impressions in like graphic language. On the 21st of April he writes:—"Let me describe a sight that fell under my notice about the end of last month. The weather had been very dry for some weeks, and all our usually green pastures were scorched and brown. The orange and pimento trees drooped and thirsted for rain. The mango trees alone seemed to enjoy the hour, and were a mass of bloom. I had been sent for, to see a sick man in the village, and took a short cut through Rose Hall Pen, halting a moment near a clump of tall mango trees. The air was melodious with the hum of bees and minute insects, intent on their sweet repast. It was about 5 p.m. My negro pen-keeper joined me at this moment; and, while conversing with him, my attention was suddenly attracted to a mango branch that was hanging not more than six feet from the ground, laden with blossom, and literally alive with some beautiful insect-life. I could not believe my eyes. Though not ten yards from the spot, I thought I must be mistaken. I said to the negro at my side, 'Look there, my man. What are those?'

"'Heigh, parson! Dem is soso-bugs!' he replied, looking astonished.

"'Soso-bugs!' I said, 'why, man, these are the very things I have been looking for day after day.'*

"Sure enough, on closer inspection, they proved to be *Uraniæ* in the most perfect condition, evidently just emerged from pupa. There were above fifty of them together, in a space of two yards square, flying round and round the branch, some alighting on the leaves and spreading their gorgeous wings, in which the rich velvet-black, the bright emerald bands, and the notch of ruddy gold blend and harmonise so beautifully; others contending playfully in the air for a moment, to return again presently to their evening meal. I had seen *Uraniæ* on high trees disporting themselves, but never before saw them so near to the ground. Unfortunately I had no net with me. I might have returned for one, but duty urged me away. Within an hour I passed the same spot on my return. Not an *Urania* was to be seen! And though, on the next day, we caught several in the same clump of trees, yet I never saw another on the branch I have described."

I will not risk the spoiling of these delightful pictures by adding a single touch of my own, but leave them in their native beauty.

SOME NOTES ON COLLECTING IN SOUTHERN INDIA.

By Edwin Lester Arnold.

To the enthusiastic collector India offers a wide and enticing field of operations, especially if he should be a beginner and fortunate enough to be pleased with everything that comes to his net. In that case there are many localities where he may revel to his heart's content amongst the members of every branch of Entomology, filling his boxes and cabinets with hundreds of butterflies, which, if less bright and gaudy than some of those of South America and the islands of the Pacific, yield the palm in variety and size to none; and, if he is inclined to Coleoptera or Hymenoptera, may bewilder himself with hordes of strange beetles and prismatic-winged bees.

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* I have described (*loc. cit.*) the suddenness and the brevity of the seasonal appearance of *Urania*.—P. H. G.

One of the best localities in Southern India for the naturalist is on the southern slopes of the great Neilgherry Hills, in the Madras Presidency. Here vegetation and insect life are found in zones varying as one ascends from the dense bamboo jungles that clothe the foot of the ghauts, through the thickets of palm, plantains, and *Butea frondosa*, upwards through forests of tall trees, matted together by rattans and flowering creepers, until one reaches the English sanitarium and military station of Coonor, some 8000 feet above the sea-level, with a delightful climate, and a fauna and flora combining the characteristics of temperate and tropical regions.

In this happy hunting ground I recently spent some months to recruit health and strength after a long spell of jungle fever, caught in the jungles more to the southward in Travancore and Cochin while working among the famine-stricken natives of those states. I was considerably surprised to see how much both officers and privates had taken to collecting in the district. In the early morning scores of soldiers, in their light and becoming white and gold "undress" uniform, turn out with nets and boxes, and, until the bugle sounds for parade, the butterflies have anything but a lively time. Every lane is patroled, every "shola" or patch of brushwood searched, and every flowering shrub guarded by nets of all sizes and colours. The spoil obtained from even a single morning's work is by no means contemptible; the only thing is, the butterflies are often of such large spread of wings that it is difficult to carry them in any ordinary collecting-boxes,—even the inside and outside of a great sun-hat will not accommodate as many as one often takes in a couple of hours.

Amongst the largest of the butterflies common here is the handsome *Papilio Pompeus*, measuring nearly seven inches across the wings, with the upper pair deep velvety black, and the lower wings satin-yellow, with the veins marked in black. It is a high flyer, and the moment has to be watched for when it comes sailing down in easy circles and alights upon some low-growing shrub, especially *Clematis Wightiana*, on which perhaps its caterpillar feeds, though I have never succeeded in finding it there.

Another large and handsome insect, *Papilio Polymnestor*, is fairly common, but avoids the sunlight, and flutters softly about in the deep gloom of the most secluded groves of fig and mango trees, where it might be mistaken for a huge bat but for the pale lavender colour of its lower wings. When feeding they are so absorbed that they may be taken between the thumb and finger without much difficulty.

But it would be hopeless and very dry reading to enumerate all the species that may be found in the neighbourhood of Coonor. Every collector must hope to make their acquaintance personally some day, and when he does he will probably long remember his first morning in the tropics—an event in one's life which can never be adequately described to outsiders nor ever forgotten by oneself.

Lower down the slopes of the mountains, at an elevation of about 4000 feet, the bamboo jungles commence, and the vegetation becomes strictly tropical and insect life even more abundant than higher up. In these bamboo jungles there are occasional pools surrounded by tall lemon-grass, or swampy places by the side of nullahs or water-courses. These are always very productive localities, but they also harbour snakes, vast numbers of leeches, and very often a tiger or two; so the collector must keep his eyes open. In such a place I have spent the early hours of the day, filling box after box, and, in the excitement of the chase, rushing over the marshy ground and scrambling among the rocks utterly regardless of snakes, tigers, or sunstroke; but I more than once paid the penalty afterwards with an attack of fever.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Polyommatus Hippothoe and P. dispar.—In No. 23 of 'Le Naturaliste,' published in Paris, March 1st, 1880, some "Notes lépidoptèrologiques" are contributed by Mons. R. F. Brown, of Bordeaux. In the first part of his article the author speaks of the varieties of *Polyommatus Phlæas*, *P. Xanthe*, and *P. Gordius;* then he comes to *P. Hippothoë* and *P. dispar.* As is well known to entomologists, in certain double-brooded species, the first brood is sometimes so different, in colour and even in size, from the second, that they seem to be different species. Such is the case with *Araschnia Prorsa*, in the French vernacular called "Carte géographique brune," and *A. Levana*, "Carte géographique fauve." *A. Levana*, the spring form, is the smaller of the two, and the butterfly emerges from the hybernating pupa in May; *Prorsa* makes its appearance about the end of July. During the winter another variety of this genus may be obtained by artificial heat, which again differs from *A. Prorsa* and *A. Levana;* it is then called *A. Porima*, "Carte géographique rouge." *A. Porima* is sometimes found in a state of nature. With respect to *Polyommatus Hippothoë* and *P. dispar*, which are, it would seem, one and the same species, I translate freely from the French a part of Mons. Brown's interesting article. He says:—"As we are now speaking of the genus *Polyommatus*, I would ask in my turn for some information respecting *P. Hippothoe*, This beautiful insect is common in the marshes which extend to the north and north-west of Bordeaux, and also in other directions. It has two generations; the first in May and June, the second in August and September. The specimens of the second brood offer nothing remarkable, and correspond undoubtedly to the type described and figured by Godart in the first volume of his work; it is not so with respect to the specimens of the first brood. The latter answer in size and brilliancy of colours almost exactly to the two figures, and the description given by Duponchel, in his supplement on *dispar*, described later on by all authors, and by Duponchel himself, as being allied to *P. Hippothoë*. M. Gaschet, a lepidopterist of Bordeaux, who possesses specimens of the English *dispar*, finds, it is true, some difference from ours: 'There is something different,' he tells me, 'but very little. For my own part, I, who am entirely disinterested in the matter, find the difference so insignificant as to be almost imperceptible.' I should be interested to hear whether, in the north, as in our country, *P. Hippothoe* is double-brooded, and, if so, why is not the first '*dispar*'? I also ask myself, if the celebrated English *dispar* butterflies were not merely specimens of the first brood, collected on account of their beauty and high value, while those of the second brood were neglected. It is, at least, what takes place at Bordeaux with respect to *Anthocharis cardamines*, which is double-brooded, on the hills which border the Garonne, at two leagues distance from the city. Collectors in Bordeaux despise the first brood which appears in March and April, because it is smaller and less beautiful, and go in search of the specimens of the second brood, which are remarkable here for their large size and brilliant colouring. Let us suppose *A. cardamines* to be a species in great demand, as collectors say, that is to say, a species for exchange, the Bordeaux 'amateurs' would not fail to despatch specimens in large quantities, as they have done with the unfortunate *A. Belia*, which is ruthlessly hunted every year. The Bordeaux type of *A. cardamines* would not fail to pass as larger and more brilliantly coloured than the specimens of the north, and nomenclators of varieties would not fail to christen it —perhaps '*cardaminoïdes*.' Finally, the foreign 'amateur,' passing through our city, who might think it a great treat to take '*propria manu*' this beautiful variety, would be cruelly disappointed, when going to catch it at the ordinary time the insect makes its appearance, *i. e.*, in April, only to obtain specimens exactly similar to those of his own country. The date given by Duponchel for the emergence of *P. dispar*, according to information sent from England to M. Alex. Lefebvre, is extremely vague; possibly this vague information was given on purpose by English collectors anxious to keep their monopoly. June, July, August, he says. Does that indicate a single generation? Here we take it in June and in August; but, as I already stated, the individuals taken in August are totally different to those taken in June."—Alfred Wailly; 110, Clapham Road, London, S.W.

[*P. dispar* was, I believe, not double-brooded in this country. The larva was to be found feeding upon the water-dock, *Rumex hydrolapathum*, in May and June. The imago made its appearance in July and August; there was never any attempt to make a monopoly of the insect, nor to make any mystery as to its time of appearance by the collectors. It was very abundant; and when I first knew the fens, over forty years ago, the imagos were to be purchased from the collectors at from 3*s*. to 4*s*. per dozen. I have seen but few specimens of the continental *Hippothoë*, so am hardly prepared to speak positively as to their identity with our insect, but think they are identical.—F. Bond.]

Notes on the rearing of certain hybernating and other larvæ of British Lepidoptera.—*Ourapteryx sambucata.*—The larvæ of this moth hybernate easily either in the open air or under cover in a shed or outhouse. If reared in the open air, they should be secured in a strong muslin bag tied to a branch of blackthorn (*Prunus spinosa*), in some sheltered position. If reared under cover, twigs of the same tree should be placed in a wide-mouth bottle filled with water, through a suitable aperture in the cork, and the larvæ secured by muslin tied round the neck of the bottle, and regularly supplied with fresh food so long as a vestige of green foliage is obtainable. Wintering these larvæ, and probably others, in a somewhat darkened place prolongs the period of hybernation, and prevents them wandering in search of food before either the blossom or leaves appear on the blackthorn. This is evident by the partially-denuded spines and branches in the case of those wintered with insufficient shelter. The larvæ of *O. sambucata*, as is well known to entomologists, derive their specific name from the elder (*Sambucus nigra*), though I have never obtained them from that tree. I have, however, beaten them out of whitethorn (*Cratægus oxyacantha*), and frequently out of blackthorn, which latter seems their staple food in this locality. *Lasiocampa quercifolia.*—Feed well on blackthorn, and hybernate so closely attached to the stems as to appear like excrescences of the bark, which they so exactly resemble in colour as to sometimes deceive the most practised eye. The species may be wintered similarly to *O. sambucata*, but they thrive better in the open air in a sheltered position. *Lasiocampa rubi.*—Roll themselves up in rings and hybernate in that state. May be wintered well among heather (*Calluna vulgaris*) and other species of *Ericæ*, sheltered and protected from sunshine as much as possible. A shallow circular wooden vessel, one foot deep and two feet in diameter, filled with mould in which roots of heather have been closely planted, and covered with muslin tied tentwise to a central support, makes an excellent and cheap mode of providing them with winter-quarters. The muslin covering also affords protection to the food-plants by preserving them green throughout the winter, unaffected by frost or snow, and thus ready for the larvæ when roused into activity by the warmth of spring. *Aplecta nebulosa.*—Hybernate on dock (*Rumex*) planted and protected similarly to the preceding. The folds of the muslin at the apex where tied to the support afford good means of hybernation. *Plusia chrysitis.*—The August or second brood pass the winter in the larval state, and may be easily hybernated on white dead nettle (*Lamium album*) planted in a large-size flower-pot secured by muslin tied round the rim and to a central support. On the approach of winter, the larvæ, which are then about a quarter of an inch in length, cease to feed, and secrete themselves in the folds or curls of the fallen leaves, where they remain dormant throughout the winter. In spring they are tempted from their retreat by the young nettles which spring up from the roots, or until supplied with food obtained from some lane or sheltered hedge-side where vegetation is in a forward state. *Cerigo Cytherea.*—Feed on coarse and fine grasses (*Poa*) throughout the winter, and are full fed the following March or April, when they construct their cocoons among the roots. A garden seed-pan filled with mould in which a sod of turf has been planted, covered and protected as before described, is a most suitable receptacle for these larvæ. It is advisable to examine the turf and free it from predatory insects before placing the young larvæ on the grass. A safe plan is to rear them for a few weeks in a smaller receptacle, aud remove them to the larger to complete their growth and transformation to the pupal state.—GEO. J. GRAPES; 2, Pownall Crescent, Colchester.

CATOPTRIA PARVULANA IN ISLE OF WIGHT. — While staying at Freshwater last August I took a fine specimen of *Catoptria parvulana* (female), on the downs. The locality was similar to that described by Mr. Bond of his captures in 1857. There was an abundance of the dwarf thistle (*Carduus acaulis*) growing on the spot, on which Mr. Bond suggested the larva may probably be found to feed. — W. S. RIDING; 25, Endsleigh Gardens, N.W.

NEW LOCALITY FOR COLEOPHORA CONSPICUELLA.—On May 13th I was fortunate in coming across the larva of the above rarity in some abundance. I had been collecting in the neighbourhood of Holmwood, near Dorking, nearly the whole day with very little success; and, as a natural consequence, I was quite tired. So I packed up my traps and made off to the station, but on arriving there I found I had nearly two hours to wait for a train. I came out and strolled off in quite an opposite direction to pass away the time. I had not been walking more than a quarter of an hour before my attention was drawn to a lot of *Centaurea nigra* growing on a nice sloping bank, the terminal shoots of which plant were screwed up by the larvæ of a *Depressaria*. On getting over the hedge to ascertain whether they were other than *D. liturella*, I saw within a yard of me seven or eight cases of *C. conspicuella*. My fatigue very soon vanished, for within ten minutes I had taken seventeen cases. I need hardly say I lost my train, and had to go by a later one, but before leaving I had the satisfaction of taking above ninety cases. From their size I am convinced the larva must be nearly full fed. I could have taken many more, but I left the small and medium-sized cases, knowing how difficult the small larvæ are to rear. I took five small ones in the neighbourhood of Cuxton, near Strood, last year, none of which were reared, although I paid every attention to them, but I think I am now in a fair way to obtain a series this year, and I hope many for my friends.—G. Elisha, Shepherdess Walk, City Road, N.

OBITUARY.

Francis Oram Standish.—It is so seldom that we meet with a case in which for three generations, in one family, there have been collectors of insects, that the fact should be put on record. Mr. F. O. Standish, who was well known as a careful and assiduous lepidopterist, died at Cheltenham, where he had lately lived, on April 12th last. His father was Benjamin Standish, who for sixty summers used to trudge from Camberwell to Darenth and Black Park in search of insects. There was still one generation before him; the three having collected for upwards of one hundred consecutive years. The last, whose death we now record, worked up to within a short period of his decease. One of the latest additions to our list of Lepidoptera, viz. *Eupœcilia gilvicomana*, was discovered by him. His collection, which comprises many of the insects from the cabinets of his ancestors, recently passed into the hands of Mr. E. G. Meek. Mr. F. O. Standish was never married. His age was forty-eight years.—J. T. C.

REVIEWS.

Notes of Observations on Injurious Insects. Report, 1879. London : W. Swan Sonnenschein & Allen. 1880.

Workers in other branches of Science are apt to look down on entomologists in the light of flycatchers who make mere collections, rather than as students who contribute to the world's knowledge of the creatures they catch. No doubt there is some truth in this accusation; for, after all, there is enough in the beauty of the objects which make up this great division of the Invertebrata to justify one fond of Natural History in forming such a collection. But we should scarcely complain of the collector; for, with the exception of those who have been specially trained from youth to the study of Biology, the men of science have risen from the great body of collectors.

In addition to the accurate knowledge of the life-history and anatomy of any particular group of animals, there is another study, *viz.*, the position an animal bears with regard to man—whether its existence is to his advantage or otherwise in the race for the survival of the fittest. This is the object of the valuable Observations collected through the energy and patience of Miss E. A. Ormerod and her co-workers, the Rev. T. A. Preston, M.A., and Mr. E. A. Fitch, F.L.S. A report of these Observations has been recently issued, and forms an interesting illustrated pamphlet of forty-five royal octavo pages.

The work of obtaining these observations from many and remote parts of the country is necessarily difficult. Prejudice, ignorance and apathy have to be overcome; ignorance no doubt being the chief difficulty. Miss Ormerod has wisely given in the Report now issued woodcuts of life-histories of most of the insects under observation. This will be a great help to others who are willing to report upon, but who were unable to name, the insects, whether larval or otherwise, which have arrested their attention.

In the report for 1879 about eighty species of injurious insects have been under consideration. The Observations have been made in many and widely separate places, extending from the north of Scotland to the south of England. No one can doubt the value of concerted action in getting together a large mass of material from which Miss Ormerod and her friends unravel the threads which make up the skein of knowledge. We are glad to observe that the Observations extend also to the weather during the time when the occurrences of particular insects were noted. The mere record of an insect being abundant, and damaging or otherwise, amounts to little. Unless some of the surrounding circumstances are also given, we shall never gather the cause or rule for exceptional abundance, or be able to combat our enemies. Our greatest safety will probably be the expectance of a "blight," so that we may provide a preventative rather than a cure after its appearance.

We are pleased to note that political economists, as well as entomologists, have taken notice of the importance of Miss Ormerod's work. Several societies have referred to it, notably at the meeting on May 5th, 1880, of the Royal Agricultural Society of England. At that meeting the chairman referred to an application from Miss Ormerod for the co-operation of the Royal Agricultural Society in respect to the observation of insects injurious to farm crops. He further stated "that the committee hoped that the members of the council of the society would assist Miss Ormerod in her useful work." So thorough and systematic is the work that we cannot forbear supplementing that gentleman's request by one to our readers, to do likewise. Miss Ormerod provides the necessary forms free of expense, and our country readers would do well in distributing them amongst their neighbours who would be likely to collect and return the necessary information for carrying on this interesting work.—J. T. C.

The Geological Antiquity of Insects. By HERBERT GOSS, F.L.S.
London: John Van Voorst. 1880.

In twelve papers upon Fossil Entomology, which are here collected and reprinted, Mr. Goss very fully and in a most lucid manner places his subject before his readers. These papers will repay the time spent in reading them, and we hope they are only an earnest of future work in a field where hitherto there have been but few labourers.—J. T. C.

ERRATUM.—Entom. xiii. 112. Dr. Power's note referred to *Dromius nigriventris*, and not to *A. consputus*.

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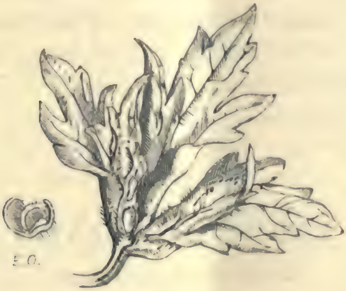
CECIDOMYIA RANUNCULI?

By Edward A. Fitch.



Gall of Cecidomyia ranunculi?

Last August I found in one of my meadows, which had that year been mown for hay, several cecidomyideous galls on the lower leaves of *Ranunculus repens*. These were quite new to me, and were found in one corner of the field only, but there were somewhat abundant.

The only gall on *Ranunculus* which I can find described is that of Bremi's *Cecidomyia ranunculi*, and since his time this does not appear to have been again found. I am very doubtful whether my gall is really Bremi's species, and, unfortunately, have now only the dry gnats to examine: his description differs from my specimens in many particulars, but I should like to compare living examples, which only can be satisfactory, as these fragile little Dipterons change greatly after death.

The galls were only found on the lower leaves of the buttercup (*R. repens*). Of the three palmate segments into which these leaves are divided, the two outer ones were invariably rolled inwards from the base, and thus formed a thickened and hardened pseudo-gall at the base of the leaf (see figure); the middle segment of the leaf was rarely galled. The galled segments were in no way discoloured; Bremi's galls were reddish brown. There were several larvæ of the *Cecidomyia* in each roll; with me the numbers varied from two to ten; these were pale ochreous, or cream-colour; certainly not orange-yellow, as says Bremi. The metamorphosis took place within the gall, and I bred many imagos at the end of August.

Cecidomyia ranunculi is described in the 'Neue Denkschriften der allg. Schweiz. Gesellschaft,' vol. ix., p. 29 (1847). The galls from which the imagos were bred occurred on *Ranunculus bulbosus*, near Zurich, in July; but Bremi also found somewhat similar galls, at the same time and place, on the leaves of *Trifolium pratense*; he did not breed the gall-makers, but describes the gall as a variety of *Cecidomyia ranunculi*.

Maldon, Essex, December, 1879.

BRITISH GALL-GNATS.

By Edward A. Fitch.

Having recently called attention to one Dipterous family, in which gall-makers are common, and said a few words on our little knowledge of the British species (Entom. xii. 257), I am led to think that a few remarks on our gall-gnats may be acceptable and instructive.

In speaking of the *Trypetidæ*, I have already stated that while the imagos are amongst the most beautifully marked and brightly coloured of the Diptera, the galls which they inhabit are especially liable to be overlooked. With the *Cecidomyidæ* the converse of this holds generally, for many of the plant deformities they occasion are amongst the best known of all galls, while the gall-gnats themselves are very small and obscure; though when examined alive, and under a lens, the often bright red colour and beautiful antennæ, especially of the males, make them objects of great beauty and interest. Their preservation for a collection is, however, difficult, and the specific characteristics very superficial. It is this which makes a knowledge of their economy so important, and in the case of many species it is most interesting.

The *Cecidomyidæ* have had a double band of students; the abnormal vegetal productions, which many of them occasion, have attracted the attention of many botanists, as well as entomologists; while but few have turned their attention to the insignificant gall-makers themselves.

Both must go hand in hand. J. J. Bremi, of Zurich, was the great pioneer in this direction (1847), and he was soon followed by H. Loew (1850) and Winnertz (1853). Bremi's valuable memoir, published in volume nine of the 'Neue Denkschriften der allg. Schweizerischen Gesellschaft,' is illustrated with two excellent coloured plates, containing admirable figures of twenty-seven distinct galls, together with various details of certain imagos. H. Loew's Dipterologische Beitrage, No. 4, was published in the 'Programm des Königl. Friedrich-Wilhelm-Gymnasiums zu Posen,' and was followed in the succeeding year by a paper, 'Zur Kenntniss der Gallmücken,' in Linnæa Entomologica (vol. v., pp. 370—384). Winnertz' important "Monographie der Gallmücken" was also published in Linnæa Entomologica (vol. viii., pp. 154—324); this is illustrated with four plain plates, mostly containing details, especially antennæ, palpi, wings and ovipositors, of the imagos. Several of these gnats and their galls came under the notice of the older authors, notably Réaumur, Frisch, Swammerdam, DeGeer, and Schrank, but it is with Meigen that the real history of all Diptera commences. The first volume of his wonderful work was published in 1818. This contained the *Cecidomyidæ;* in the whole work Meigen has described fifty-two species, but the identity of several is quite uncertain.

Further reference to gall-gnat literature cannot be made here. I only need say that Dr. Franz Löw is now studying the *Cecidomyidæ* and their productions, and his papers have lately been published in the 'Verhandlungen z.-b. Gesellschaft in Wien.' Volume twenty-six of this publication contains the "Synopsis Cecidomyidarum," by J. E. v. Bergenstamm and Paul Löw, of which I have made great use in preparing the accompanying table of our British species.

Rondani's division of the family *Cecidomyidæ* into the two sub-families *Lestreminæ* and *Cecidomyinæ* is there adopted. The forty-eight species distributed amongst six genera of *Lestreminæ* do not include a gall-maker, most of the larvæ feeding in rotten wood; these are related to the *Mycetophilidæ*. The sub-family *Cecidomyinæ* includes 458 good species, to which may be added five which are described but not named, and 143 whose economy is recorded, but the imagos are not sufficiently described. This makes a total of 606 species, which are included in seventeen genera. Sixteen new species have since been characterised. The economy of these numerous *Cecidomyinæ* is very varied; many feed in rotten wood, some in decaying plants and bulbs, some under the bark of trees, a few in fungi, others in living plants, either in fruit organs or on leaves without any hypertrophy, but the majority are true gall-gnats causing galls on variable parts of nearly all orders of plants; a few, however, are inquilines in galls formed by other species, both dipterous and hymenopterous, while the larva of *Diplosis aphidimyza*, as I have already remarked in these pages, feeds on various Aphides. It is thus seen there are several exceptions to the gall-making peculiarity. Owing mostly perhaps to the far too general distribution of that great corn pest, *Cecidomyia tritici*, the small apod, mostly yellow or orange, larvæ of the *Cecidomyidæ* are well known. In the gall-making species some pupate in the gall, while others quit it when full-fed larvæ, and change in the earth or amongst rubbish; one or two species spin a cocoon. In my synopsis of species I have instanced the character of their metamorphoses in all cases, as it is important when breeding the gnats. Most of the larvæ are exceedingly lethargic in their movements, but a few, especially those of *Diplosis loti*, have an extraordinary saltant power. Nicholas Wagner's three remarkable memoirs on the viviparous larvæ of certain species which live under the bark of trees only need mention to be referred to. The gall-gnat larvæ are preyed upon by various Hymenopterous parasites belonging to the families *Ceraphronidæ*, *Platygasteridæ*, *Mymaridæ*, *Eurytomidæ*, *Torymidæ*, *Pteromalidæ*, *Hormoceridæ*, *Encyrtidæ*, and *Tetrastichidæ*. To refer to all the points of interest in the economy of the *Cecidomyidæ*, and to keep this article within reasonable limits, is impossible. I will therefore proceed with a review of our British species, giving the first English references to occurrence, and stating where the galls are figured; the arrangement is alphabetical, as this appears the most convenient. In this country first Mr. Hardy, then Mr. Inchbald, and later Mr. Müller published from time to time some most interesting notes on the productions and habits of these gall-making Diptera, and during the last few years Dr. Trail has added much to our knowledge of the galls by his papers in the 'Scottish Naturalist,' which have lately been collected and revised in the 'Transactions of the Natural History Society of Aberdeen.' Still much is to be done; additions to the following list should not be difficult. The three volume systematic work of Walker and Haliday on our British Diptera is well known. There (vol. iii., p. 73), we read, "These flies (Cecidomyzidæ) are the most elegant and delicate little creatures in the whole of the Diptera."

ACROPHILA, *Wtz.* (CECIDOMYIA). Walker, I. B. iii. 82. W. Cole, Proc. Ent. Soc. Lond. 1874, p. xix.

Pod-like leaflets of *Fraxinus excelsior.* Metamorphosis external.

BETULÆ, *Wtz.* (CECIDOMYIA). Walker, I. B. iii. 85. Figured, Fr. Löw, Verh. z.-b. Gesell. Wien. xxviii., pl. iv. fig. 4.

Enlarged fruit of *Betula alba.* Metamorphosis internal.

BOTULARIA, *Wtz.* (DIPLOSIS). Hardy, Scot. Gard. iii. 139. Walker, I. B. iii. 111. Müller, Entom. v. 248. Figured, Bremi, pl. i., fig. 17.

Swollen midrib of leaflets of *Fraxinus excelsior.* Metamorphosis external.

BRASSICÆ, *Wtz.* (CECIDOMYIA). Walker, I. B. iii. 84.

Deformed flowers and pods of *Brassica oleracea*, &c. Metamorphosis external.

BURSARIA, *Br.* (CECIDOMYIA). Walker, I. B. iii. 89. Müller, Entom. vi. 180. Figured, Bremi, pl. i. fig. 20.

Tubular galls on leaves of *Glechoma hederacea.* Metamorphosis internal.

BUXI, *Lab.* (DIPLOSIS). Fitch, Essex and Suffolk. ? Armistead, Zool., 2nd ser., p. 1201. Figured, Laboulbène, Ann. Soc. Ent. Fr., 5th ser., vol. iii. pl. 9.

Swollen leaves of *Buxus sempervirens.* Metamorphosis internal.

CALLIDA, *Wtz.* (DIPLOSIS). Walker, I. B. iii. 95.

Thickened seed capsule of *Papaver Rhœas* and *P. dubium.* Metamorphosis internal.

CAMPANULÆ, *Müller* (undescribed). Proc. Ent. Soc. Lond. 1871, p. 8 (*see* Entom. v. 295). Trail, Trans. N. H. S. Aberdeen, 1878, p. 66.

Axillary bud-galls and inflated seed-capsules of *Campanula rotundifolia.*

CAPREÆ, *Wtz.* (HORMOMYIA). Hardy, Scot. Gard. iii. 80. Walker, I. B. iii. 123. Figured, Bremi, pl. ii. fig. 38.

Very small conical hard galls on leaf of *Salix caprea* and *S. aurita*. Metamorphosis external.

cardaminis, *Wtz.* (Cecidomyia). Walker, I. B. iii. 83.

Deformed leafbuds and flowers of *Cardamine pratensis*. Metamorphosis external.

cerastii, *Binnie* (Cecidomyia). Proc. N. H. S. Glasgow, iii. 181. Trail, Trans. N. H. S. Aberdeen, 1878, p. 57.

Swollen, fleshy, terminal leaves of *Cerastium vulgatum* (var. *glomeratum* and var. *viscosum*). Metamorphosis internal.

clausilia, *Br.* (undescribed). Fitch, Maldon. Figured, Bremi, pl. ii. fig. 33.

Short marginal incrassations of leaf of *Salix alba*.

corni, *Gir.* (Hormomyia). Müller, Ent. Ann. 1872, p. 15.

Hard multilocular conical gall on leaf of *Cornus sanguinea*. Metamorphosis external.

corrugans, *Fr. Löw* (Cecidomyia). Trail, Trans. N. H. S., Aberdeen, 1878, p. 62.

Folded and distorted leaves of *Heracleum Sphondylium* and *Chærophyllum aromaticum*. Metamorphosis external.

cratægi, *Wtz.* (Cecidomyia). Walker, I. B. iii. 13.

Terminal leaf rosette of *Cratægus oxyacantha* and *C. coccinea*. Metamorphosis external or internal.

dryobia, *Fr. Löw* (Diplosis). Trail, Trans. N. H. S., Aberdeen, 1878, p. 74. Müller, Ent. Mo. Mag. vii. 89. Figured, Fr. Löw, Verh. z.-b. Gesell. Wien. xxvii., pl. i., fig. 5.

Thickened and discoloured marginal folds of leaf of *Quercus Robur*. Metamorphosis external.

euphorbiæ, *H. Lw.* (Cecidomyia). Walker, I. B. iii. 82. Müller, Zool., 2nd ser., p. 1204. Figured, Bremi, pl. ii., figs. 24 and 25.

Terminal leaf-tufts on twigs of *Euphorbia*. Metamorphosis internal.

fagi, *Hart* (Hormomyia). Walker, I. B. iii. 121. Figured, Réaumur's Memoirs, pl. 38. Ratzeburg, Forstinsecten, iii., pl. v., fig. 14.

Smooth pyriform gall on upper side of leaf of *Fagus sylvatica*. Metamorphosis internal.

fasciata, *Meig.* (Hormomyia). Walker, I. B. iii. 119.

Deformed flower-buds of *Epilobium angustifolium*.

Fischeri, *Ffld.* (Hormomyia). Müller, Proc. Ent. Soc. London. 1871, p. x. (*see* Entom. v. 298).

Multilocular swellings at the leaf-bases of *Carex pilosa*. Metamorphosis internal.

galeobdolontis, *Wtz.* (Cecidomyia). Walker, I. B. iii. 85. Inchbald, Ent. W. Int. x. 69. Figured, Bremi, pl. ii., fig. 26.

Hairy pouch like gall of the young shoot of *Galeobdolon luteum*. Metamorphosis internal.

galii, *H. Lw.* (Cecidomyia). Walker, I. B. iii. 86. Trail, Scot. Nat. i. 156, Trans. N. H. S., Aberdeen, 1878, p. 62.

Stems and flower-stalks of *Galium Mollugo* and *G. verum*. Metamorphosis external.

genistæ, *H. Lw.* (Asphondylia). Müller, Ent. Ann., 1872, p. 15.

Buds of *Genista germanica*. Metamorphosis internal.

GIRAUDI, *Ffld.* (CECIDOMYIA). Trail, Scot. Nat. ii. 78; Trans. N. H. S., Aberdeen, 1878, p. 59.

Folded fleshy leaflet of *Astragalus hypoglottis.* Metamorphosis external.

HELIANTHEMI, *Hardy* (DIPLOSIS). Ann. Mag. Nat. Hist., 2nd ser., vi. 187 (1850). Trail, Trans. N. H. S., Aberdeen, 1878, p. 56.

Terminal leaf-tuft of *Helianthemum vulgare.* Metamorphosis internal.

HERACLEI, *Kltb.* (undescribed). Trail, Scot. Nat. iv. 15; Trans. N. H. S., Aberdeen, 1878, p. 62.

Folded segments of leaf of *Heracleum Sphondylium.* Metamorphosis external.

HETEROBIA, *H. Lw.* (CECIDOMYIA). Hardy, Ann. Mag. Nat. Hist. vi. 185. Walker, I. B. iii. 81. Figured, Bremi, pl. ii., fig. 23.

Terminal artichoke gall of *Salix amygdalina, S. purpurea,* &c. Metamorphosis internal.

HYPERICI, *Br.* (CECIDOMYIA). Haliday, Ent. Mag. iv. 148. Figured, Bremi, pl. ii., fig. 29.

Terminal leaf-capsule of *Hypericum humifusum* and *H. perforatum.* Metamorphosis internal.

INVOCATA, *Wtz.* (DIPLOSIS). Walker, I. B. iii. 106.

With *C. acrophila* in leaflets of *Fraxinus excelsior.* Metamorphosis external.

JACOBÆÆ, *H. Lw.* (DIPLOSIS). Trail, Trans. N. H. S., Aberdeen, 1878, p. 65.

Swollen fleshy green flower-heads of *Senecio Jacobæa* and *S. aquaticus.*

JUNIPERINA, *Lin.* (HORMOMYIA). Müller, Ent. Ann., 1872, p. 15. Figured, DeGeer, Memoires, vol. vi., pl. 25, figs. 7–10.

Terminal cone-like galls on twigs of *Juniperus communis.* Metamorphosis internal.

LATHYRI, *Ffld.* (undescribed). Trail, Scot. Nat. ii. 78; Trans. N. H. S., Aberdeen, 1878, p. 60.

Fleshy leaflets of *Lathyrus pratensis* and *L. sylvestris.* Metamorphosis internal and external.

LINARIÆ, *Wtz.* (DIPLOSIS). Walker, I. B. iii. 97.

Terminal leaf-tuft of *Linaria vulgaris.* Metamorphosis internal.

LOTI, *DeG.* (DIPLOSIS). Walker, I. B. iii. 97. Curtis, Farm. Ins., p. 491. Figured, DeGeer, Memoires, vi., pl. 27, fig. 1. Bremi, pl. i., fig. 21.

Blooms and pods of *Lotus corniculatus, Medicago falcata, Vicia cracca,* &c. Metamorphosis external.

MARGINEMTORQUENS, *Wtz.* (CECIDOMYIA). Walker, I. B. iii. 79. Müller, Ent. Mo. Mag. vi. 109. Figured, Bremi, pl. ii., fig. 32.

Marginal rolls of leaf of *Salix viminalis.* Metamorphosis internal.

MEDICAGINIS, *Br.* (undescribed). Trail, Trans. N. H. S., Aberdeen, 1878, p. 59. Figured, Bremi, pl. 1, fig. 16.

Fleshy leaf of *Medicago sativa, Lotus corniculatus,* &c. Metamorphosis external.

MILLEFOLII, *H. Lw.* (HORMOMYIA). Inchbald, Ent. W. Int. viii. 195. Müller, Ent. Mo. Mag. vii. 39. Figured, Fr. Löw, Verh. z.-b. Gesell. xxiv. pl. ii., fig. 3.

Leaf-axils of *Achillea millefolium*. Metamorphosis internal.

onobrychidis, *Br.* (Cecidomyia). Trail, Soc. Nat. ii. 78. Figured, Bremi, pl. ii., fig. 30.

Fleshy folded leaflets of *Onobrychis sativa*, *Medicago*, &c. Metamorphosis external.

papaveris, *Wtz.* (Cecidomyia). Walker, I. B. iii. 78. Figured, Laboulbène. Ann. Soc. Ent. Fr., 3rd ser., vol. v., pl. xii., 1.

Thickened seed-capsule of *Papaver Rhœas* and *P. dubium*. Metamorphosis internal.

pavida, *Wtz.* (Cecidomyia). Walker, I. B. iii. 90.

With *C. acrophila* in leaflets of *Fraxinus excelsior*. Metamorphosis external.

persicariæ, *Lin.* (Cecidomyia). Walker, I. B. iii. 79. Müller, Zool., 1869, p. 1705.

Rolled and thickened leaf of *Polygonum amphibium* and *P. Persicaria*. Metamorphosis internal.

piligera, *H. Lw.* (Hormomyia). Walker, I. B. iii. 121. Müller, Zool., 2nd ser., p. 1201; Ent. Mo. Mag. v. 132; Figured, Ratzeburg Forstinsecten, iii., pl. v., fig. 13.

Hairy conical gall on leaf of *Fagus sylvatica*. Metamorphosis internal.

pilosellæ, *Binnie* (Cecidomyia). Proc. N. H. S., Glasgow, iii. 179.

Rolled leaf-margins of *Hieracium pilosella*. Metamorphosis external.

pimpinellæ, *F. Löw.* (Asphondylia). Curtis, Farm Insects, p. 416. Trail, Scot. Nat. i. 125. Figured, Bremi, pl. i., fig. 22, and F. Löw, Verh. z.-b. Gesell. Wien. xxiv., pl. ii., fig. 2.

Inflated seeds of *Pimpinella saxifraga*, &c. Metamorphosis external.

plicatrix, *H. Lw.* (Cecidomyia). Trail, Trans. N. H. S., Aberdeen, 1878, p. 60.

Thickened and folded leaf of *Rubus fructicosus* and *R. cæsius*. Metamorphosis external.

poæ, *Bosc.* (Hormomyia). Walker, I. B. iii. 123 (*graminicola*).

Ears of *Poa nemoralis*. Metamorphosis internal.

pruni, *Kalt.* (undescribed). Moncreaff, Entom. v. 240. Fitch, Entom. x. 30. Figured, Verh. z.-b. Gesell. Wien. xxv., pl. ii., fig. 3.

Pouches on ribs of leaf of *Prunus spinosa*. Metamorphosis external.

ptarmicæ, *Vallot.* (Hormomyia). Walker, I. B. iii. 122. Inchbald, Ent. W. Int. viii. 164.

Flower-head of *Achillea Ptarmica*. Metamorphosis internal.

pteridis, *Müller* (undescribed). Ent. Mo. Mag. viii. 99. Trail. Scot. Nat. ii. 304; Trans. N. H. S., Aberdeen, 1878, p. 77.

Thickened and discoloured pinnæ of *Pteris aquilina*.

pyri, *Bouché* (Cecidomyia). Walker, I. B. iii. 89. Müller, Gard. Chr., 1870, p. 1054.

Marginal leaf-rolls of *Pyrus communis*. Metamorphosis external.

quercus, *Binnie* (Cecidomyia). Proc. N. H. S., Glasgow, iii. 179–81.

Twisted terminal shoots of oak. Metamorphosis external.

ranunculi, *Br.* (Cecidomyia). Fitch, Entom. xiii. 145. ? Figured, Bremi, pl. ii., fig. 34.

Leaves of *Ranunculus repens*. Metamorphosis internal.

? RHODODENDRI, *Vallot* (undescribed). Trail, Scot. Nat. ii. 251.
Terminal bud-like leaf-rosettes of *Rhododendron ferrugineum.*

ROSARIA, *H. Lw.* (CECIDOMYIA). Hardy, Ann. Mag. N. H. vi. 185. Walker, I. B. iii. 77. Smith, Entom. ii. 234. Figured, Frisch, Beschr., part xii., pl. ii., fig. 1; Swammerdam, pl. 44, fig. 16; and DeGeer, Memoires, vol. vi., pl. 26, figs. 1–4.
Terminal leaf-rosettes of *Salix*. Metamorphosis internal.

ROSARUM, *Hardy* (CECIDOMYIA). Ann. Mag. N. H. vi. 186. Figured, Bremi, pl. ii., fig. 31.
Folded thickened leaflet of *Rosa*. Metamorphosis external.

RUBI, *Heeger* (LASIOPTERA). Walker, I. B. iii. 133. Figured, Réaumur, Memoires, pl. 36, figs. 1–5.
Stems of *Rubus*. Metamorphosis internal.

RUMICIS, *H. Lw.* (DIPLOSIS). Walker, I. B. iii. 100.
Deformed blooms of *Rumex*.

SALICETI, *H. Lw.* (CECIDOMYIA). Walker, I. B. iii. 90.
In terminal leaves of *Salix fragilis* with *C. terminalis*. Metamorphosis external.

SALICINA, *Schrk.* (CECIDOMYIA). Walker, I. B. iii. 80. Müller, Ent. Mo. Mag. vi. 109. Figured, Frisch, Beschr., part iv., pl. xxi., figs. 1–4; Giraud, Verh. z.-b. Gesell. Wien. xi., pl. xvii., fig. 3.
Terminal leaflets of *Salix alba*, &c. Metamorphosis internal.

SALICIPERDA, *Dufour* (CECIDOMYIA). Walker, I. B. iii. 78. Figured, Westwood, Gard. Chron., 1847, p. 588 (*C. viminalis*).
In twigs of *Salix* and *Populus*. Metamorphosis internal.

SALICIS, *Schrk.* (CECIDOMYIA). Hardy, Ann. Mag. N. H. vi. 185. Walker, I. B. iii. 77. Inchbald, Ent. W. Int. x. 61. Figured, DeGeer, Memoires, vol. vi., pl. 26, fig. 7.
Multilocular swellings of twigs of *Salix caprea*, &c. Metamorphosis internal.

SAROTHAMNI, *H. Lw.* (ASPHONDYLIA). Walker, I. B. iii. 117. Müller, Ent. Ann., 1872, p. 15. Trail, Scot. Nat. ii. 32.
Bud-shaped galls on twigs of *Sarothamnus scoparius*. Metamorphosis internal.

SEROTINA, *Wtz.* (CECIDOMYIA). Walker, I. B. iii. 84. Trail. Scot. Nat. ii. 31.
Top shoots of *Hypericum humifusum*. Metamorphosis external.

SISYMBRII, *Schrk.* (CECIDOMYIA). Walker, I. B. iii. 80. Figured, Curtis, Gard. Chron., 1845, p. 400.
Deformed flowers of *Barbarea vulgaris*, *Nasturtium*, *Sisymbrium*, &c. Metamorphosis internal.

TAXI, *Inchbald* (CECIDOMYIA). Ent. W. Int. x. 76; Naturalist, 1864, p. 79. Müller, Ent. Mo. Mag. vi. 61.
Terminal leaf-rosette of *Taxus baccata*. Metamorphosis internal.

TERMINALIS, *H. Lw.* (CECIDOMYIA). Walker, I. B. iii. 81. Müller, Ent. Mo. Mag. vii. 89. Figured, Réaumur, Mem., pl. 18, figs. 9–12; Swammerdam, pl. 44, fig. 14; F. Löw, Verh. z.-b. Gesell. Wien. xxv., pl. ii., fig. 2.
Terminal leaves of *Salix fragilis* and *S. alba*. Metamorphosis internal and external.

TILIÆ, *Schrk.* (undescribed). Trail, Scot. Nat. v. 214. Figured, Réaumur, Mem., iii., pl. 34, fig. 7.

Thickened marginal rolls of leaf of *Tilia Europæa.* Metamorphosis external.

TORNATELLA, *Bremi* (undescribed). Trail, Trans. N. H. S., Aberdeen, 1878, p. 75. Figured, Bremi, pl. i., fig. 13.

Small rifle-bullet-like galls on upper side of leaf of *Fagus sylvatica.* Metamorphosis internal.

TREMULÆ, *Wtz.* (Diplosis). Walker, I. B. iii. 114. Figured, Bremi, pl. i., fig. 14; F. Löw, Verh. z.-b. Gesell. Wien. xxiv., pl. ii., fig. 10.

Leaf and leaf stalk of *Populus tremula.* Metamorphosis external.

TRIFOLII, *F. Löw.* (Cecidomyia). Trail, Scot. Nat. i. 195. Figured, F. Löw, Verh. z.-b. Gesell. Wien. xxiv., pl. ii., fig. 4.

Folded leaflet of *Trifolium pratense* and *T. repens.* Metamorphosis internal.

ULICIS, *Trail* (Asphondylia). Scot. Nat. ii. 172; and Trans. N. H. S., Aberdeen, 1878, p. 58. Verrall, Ent. Mo. Mag. xi. 224.

Inflated flower-bud of *Ulex Europæus.* Metamorphosis internal.

ULMARIÆ, *Br.* (Cecidomyia). Walker, I. B. iii. 88. Kidd., Ent. Mo. Mag. iv. 238. Figured, Bremi, pl. i., fig. 15. Ormerod, Entom. xi. 12.

Leaf of *Spiræa ulmaria.* Metamorphosis internal.

UMBELLATARUM, *F. Löw* (Asphondylia). Verh. z.-b. Gesell. Wien. xxvii. 31. See *A. pimpinellæ.*

URTICÆ, *Perris* (Cecidomyia). Walker, I. B. iii. 89. Müller, Ent. Mo. Mag. vi. 137. Figured, Swammerdam, pl. 45, figs. 2–5; and Perris, Ann. Soc. Ent. Fr., vol. ix. (1840), pl. xi., 1.

Leaf and stem of *Urtica dioica.* Metamorphosis external.

VERONICÆ, *Vallot* (Cecidomyia). Haliday, Ent. Mag. iv. 147. Inchbald, Ent. W. Int. viii. 196. Figured, Bremi, pl. ii., fig. 28.

End of leaf of *Veronica Chamædrys.* Metamorphosis internal.

HYBRIDS AND DEGENERACY.

By Alfred Wailly.

(Membre Lauréat de la Société d'Acclimatation de Paris.)

Having received several communications on the subject of hybrid species, the last being from Herr L Huesmann, I will state the little I know, and the few facts which have come under my notice.

As is well known, hybrids have been obtained by the crossing of *Smerinthus ocellatus* with *S. populi;* also by the crossing of the different species of *Saturnia: pyri, spini,* and *carpini; Pavonia-major, Pavonia-media, Pavonia-minor.* Hybrids have also been obtained by the crossing of the oak-silkworms, *Attacus Yama-Mai* and *A. Pernyi.* These hybrids are certainly very interesting to the entomologist, but what I wish to consider is whether they have any power of reproduction, at least in a state of captivity.

In the South of France we have a very local species of *Papilio; P. Alexanor*, which, although of the same shape and colour as *P. Machaon*, has its upper wings very similar to those of *P. Podalirius.* Might not *Alexanor*, although a distinct and well-established species, have been originally the product of a natural crossing of *Machaon* with *Podalirius?* If crossings take place in a state of captivity, they may also take place in a state of liberty, and produce those species which we find so closely allied.

Yet what I am going to say respecting the hybrids of *A. Yama-Mai* and *A. Pernyi* would go against this possibility of new species being permanently obtained by natural crossings, but it is well known that in a state of confinement, Lepidoptera bred from the same small stock, degenerate to such an extent that about the third season the ova obtained become infertile, or the young larvæ too weak to live. It has been the case with several species I have bred, and I should like to hear that this was only accidental, and that the same species could be bred in confinement on a small scale for a long succession of years without showing any signs of degeneracy. With hybrids, degeneracy in a state of captivity would of course be much greater than with natural and well-established species.

From the fact that Lepidoptera, bred from the same small stock in a state of confinement, degenerate and usually become extinct in the third year, it must not be concluded that consanguinity is the cause of it. Want of space, of pure air, and proper food, may probably be the causes. In support of this I may mention that M. V. La Perre de Roo has contributed to the 'Bulletin de la Société d'Acclimatation,' several papers of the highest interest and importance on "The pretended fatal effects of consanguineous alliances," in which the author, after twenty years' experience with various species of animals, says that consanguinity is not a cause of degeneracy; that whenever the latter takes place it is due to other causes which have not been discovered.

M. La Perre de Roo maintains that degeneracy through consanguinity in the human race, as well as in all other animals, is a popular error, entirely unsupported by facts, and that the foolish prejudice which attributes all sorts of accidents to consanguinity is unworthy of being taken into consideration by science, but, as he quotes from Lebrun:—

> "On ne détruit pas aisément
> Le préjugé ni l'habitude."

The reports of M. La Perre de Roo have not yet been all published: the first appeared July, 1878; the second, January, 1879; the third, September, 1879. The last of these contains an account of his experiments on the breeding of many species of birds during a long series of years, in most cases beginning only with one couple of the same species. The generations obtained never showed any signs of degeneracy; on the contrary, several races were improved by his skilful breeding.

Hybrids of *A. Yama-Mai* and *A. Pernyi*, so far as I know, have been complete failures respecting the reproduction of the species. A few years ago, M. Bigot, one of the best French sericulturists, obtained hybrids by crossing the female of *A. Yama-Mai* with the male of *A. Pernyi*, and *vice versa*, but these races are now extinct. Yet the larvæ and moths were fine and large. The late Mr. Andrew Murray showed me, in 1876, magnificent specimens of these hybrids which he had obtained from M. Bigot. These hybrids, like those obtained by other entomologists, hybernated in the pupa state. Had the hybrid come into existence in a state of nature, and in warm countries where the parent insects could live entirely in a wild state, would the said hybrids have had the power of reproduction, and would they have continued to live as distinct species? This of course it is, as yet, impossible to answer.

M. E. Berce, author of the 'Faune entomologique Française' and other works, and who is a most experienced French entomologist, also had hybrid *Yama-Mai-Pernyi*, which, I was told, had been in existence for a few years. M. Berce gave me in Paris (I believe during the winter of 1875) some nineteen cocoons of this hybrid species; they were so thin that they could hardly be called cocoons. Evidently the insect was in the last stage of its existence, for I only obtained one female moth, which paired with a male *Pernyi*. The larvæ, when hatched, were entirely black, like *Pernyi*, and had no resemblance to *Yama-Mai*.

They had returned to the type *Pernyi*, which is the stronger of the two. The other cocoons contained dead larvæ or dead pupæ.

At a meeting held at the Society of Arts on the 25th of April, 1879, during the discussion which followed the interesting lecture delivered by Mr. Thomas Wardle, on the wild silks of India, I heard something about another hybrid which had been obtained in Bombay. The statement made by Mr. A. Rogers was as follows:—"A curious fact came under my notice. There was a man in Bombay, a barber, who made a most remarkable discovery with regard to Tusser silk. He showed me the produce of silk which had been spun by a hybrid worm, produced between the common Indian Tusser worm and what he said was the Japanese *Yama-Mai*. Whether that was the case I cannot say, but he certainly showed me two worms which were about the size of my little finger, and he informed me that the silk produced was much freer from tannin than the indigenous Tusser found in the jungle. He showed me some specimens, and, so far as I could judge, the hybrid silk was far superior to the other. Mr. Morris assured me that this hybrid would feed on the commonest trees in the country."

Mr. Wardle, in commenting upon the above statement, said, he doubted whether Mr. Rogers was correct, because the *Yama-Mai* was a Japanese species which was an oak-feeder, whereas the Tusser worm fed on very dissimilar food. Mr. Wardle said the Tusser cocoons contained no tannin or woody matter.

With regard to Mr. Wardle's assertion, I must say that the Tusser worm, like most other wild silk-producers, is essentially polyphagous, and that last year it was reared on oak by several entomologists, and on hornbeam by Mr. P. H. Gosse.

Another hybrid between *Yama-Mai* and *Pernyi* was also mentioned in 1878, but, as for some reasons it has not yet come into the public domain, I can only quote from the discoverer of this wonderful hybrid, who is M. Bourdier, of Montboyer, France. After speaking of the merits of *Yama-Mai*, and the advantages enjoyed by *Pernyi* over *Yama-Mai*, he thus speaks of his *Perny-Yama*:—"This fruitful hybrid has over its parents the immense advantage of being perfectly hardy; it will resist a temperature of 0° centigrade (freezing-point), and will eat even dried-up leaves if they are not brittle. There is a second brood each year if the breeder, by artificial means, hastens the emergence of the moths from the hybernating cocoons. Eggs scattered in the country will for ever people our oak-forests with this silk-producer, which can hardly degenerate. A mere 'delocalisation' of a few miles, which the moths will cross over with a single stroke of their powerful wings, will be sufficient for their regeneracy."

Such is the short sketch (which I have translated freely from the original French) of this hybrid which has been denominated by Monsieur Bourdier, "*Perny-Yama de Montboyer.*"

I may mention that for several years I have obtained pairings of different species:—*Pernyi* (male) with *Polyphemus* (female); *Cecropia* (male) with *Cynthia* (female), several times; *Cecropia* (male), with *Gloveri* (female); *Cecropia* (male) with *Polyphemus* (female), several times; but in all such cases the eggs were infertile Crossings of *Attacus Pyri* with *Cecropia* have proved equally fruitless.

110, Clapham Road, S.W., June, 1880.

THE TORTRICES OF SURREY, KENT, AND SUSSEX.

BY WALTER P. WESTON.

(Continued from p. 133.)

Olindia ulmana, Hub.—A local and uncommon species. The imago appears towards the end of June and in July among elm, hazel, and alder, and flies freely in the afternoon sunshine. A few years ago I met with this insect commonly among some alders, but it is very difficult to see on the wing; and I found the best plan was to lie down, when they were easily discernible against the sky. The localities are Tilgate Forest, Haslemere, and Hastings; Box Hill, Esher; and Folkestone.

Semasia spiniana, F. v. R.—Local, but much more plentiful some seasons than others. The imago appears in July and August, and flies in the afternoon sunshine. It should be looked for among blackthorn hedges; and has occurred at Darenth and Birch Woods; Croydon, West Wickham, Mickleham, Ashstead; and Tilgate Forest.

S. janthinana, Dup.—Distributed throughout among hawthorn hedges. The imago appears in July and August, and flies in the morning and afternoon sunshine. The larva is said to feed in the ripe berries of the hawthorn late in the autumn, and to hybernate in a silken cocoon on the surface of the ground.

S. rufillana, Zell.—Not uncommon where its food-plant, the wild carrot (*Daucus carota*), occurs. The imago appears in July and August, and flies in the sunshine; it is more abundant near the coast. The larva feeds in the autumn in the seed-heads of the wild carrot; hybernates and pupates in the spring. The localities are Croydon, Mickleham, Box Hill, Sanderstead; Darenth, Gravesend, Deal, Dover, Canterbury, and Folkestone; Worthing, Eastbourne, Brighton, &c.

S. Wœberana, Schiff.—Abundant in all orchards and fruit gardens. The larva feeds on the inner bark of all kinds of fruit trees, and also common laurel. The imago appears continuously throughout the summer, and may be found at rest on the stems of the fruit trees; and also captured on the wing at dusk.

Coccyx strobilella, Linn.—Distributed among spruce firs. The larva feeds in the spruce fir cones, which should be gathered during the winter. The imago appears in May. This insect is more easily reared than captured.

C. splendidulana, Guen.—Common throughout among oaks. The imago appears in April and May, and flies in the afternoon sunshine; and is very partial to the flowers of the holly; it is also to be found on the trunks of the trees. The larva feeds on oak; and I have bred this species in plenty from galls when rearing *Ephippiphora obscurana*, but I am inclined to think the larva only entered the galls for pupation.

C. vernana, Kngs.—Named by Dr. Knaggs (E. M. M. iv. 122), from three specimens taken by Mr. E. G. Meek, in Darenth Wood, towards the end of March, 1866. I am not aware of its subsequent occurrence, and am inclined to believe the examples above mentioned to be small specimens of *E. obscurana*, to which Dr. Knaggs' description applies equally well. Nothing is known of its earlier stages.

C. argyrana, Hub.—Abundant among oaks in April and May. The imago is to be found at rest on the trunks of the trees.

C. pygmæana, Hub.—The imago appears in April and May among fir trees, and is very scarce in this country. It has, I believe, occurred sparingly in Surrey.

C. hyrciniana, Uslar.—Not uncommon among spruce firs. The imago flies freely at dusk in May and June. Mr. C. G.

Barratt has found the larva laying the leaves of the spruce parallel with the shoot, and feeding in a small web. It has occurred at Sevenoaks, Tunbridge Wells, and near Dover; Tilgate Forest, Uckfield; Croydon, West Wickham; &c.

C. nanana, Treit.—Wilkinson writes: "The imago appears in June in abundance among spruce firs, and occurs wherever those trees grow, in the South of England." I have never been fortunate enough to meet with this insect, except single specimens, and therefore do not agree in its being at all a common species. It has been taken at Croydon, Sevenoaks, and Tilgate Forest.

Heusimene fimbriana, Steph.—The imago is not uncommon among oaks in March, April, and the early part of May. It is to be obtained by beating the branches into an umbrella or net, and drops very quickly when disturbed. The larva feeds on the oak, and pupates in galls, between dead leaves, in crevices in the bark, and similar situations.

Retinia buoliana, Schiff.—Common among various kinds of firs The larva hatches in the autumn; and when the bud starts in the spring feeds actively upwards, eating out the entire centre of the shoot, and then descends into the old wood to pupate. The imago appears in June and July. It occurs throughout these counties.

R. pinicolana, Dbld.—Of similar habits to the preceding species, but much scarcer. The imago appears later, and is more sluggish in its movements. It is to be distinguished from *R. buoliana* by its straighter costa, longer and more pointed fore wings, and by the brighter colour and more silvery markings and appearance. It has occurred at Tunbridge Wells, Dartford; Hastings, Uckfield, Tilgate Forest; Croydon, West Wickham.

R. turionana, Hub.—The imago appears towards the end of April and in May among Scotch firs (*Pinus sylvestris*), and flies at dusk. The larva feeds in the central shoot, eating out the centre, and when full fed either retires into the old wood or wanders away to pupate. The larvæ should be looked for early in April, and are full fed when *R. pinivorana* larvæ are only about half-sized. It has occurred at Croydon, Weybridge, West Wickham, Shirley; Haslemere, Uckfield; Birch Wood, Tunbridge Wells, and Sevenoaks.

R. pinivorana, Zell.—Commoner than the former species.

The imago appears in May and June among Scotch firs. The larvæ feed in the shoots, but seem to prefer the side shoots rather than the central one, and should be collected about the end of April. Besides the localities named for the preceding species it has occurred at Lewisham, and near Dover.

R. sylvestrana, Curt.—Rather local. The larva feeds in the shoots of the stone pine (*Pinus pinea*) and other pines in March and April, and its presence can be detected by the pellet of frass ejected by the larva from its tunnel, and which remains affixed to the infected shoot. The imago appears in June and July, and has occurred at Croydon and West Wickham, and I have met with a single specimen in this neighbourhood.

Carpocapsa splendana, Hub.—Not uncommon in oak woods in July and August, when the imago flies freely at dusk; and is also to be obtained by beating. The specimens vary considerably in size. The larva feeds in acorns in the autumn, but I have never succeeded in rearing the insect. It occurs generally throughout these counties.

C. grossana, Haw.—The imago should be looked for among beeches in June and July, flying round the trees at dusk; but it is not common. The larva feeds in the beech mast on the seeds, and is not easy to rear.

C. pomonella, Linn.—Common in all apple orchards. The life-history is as follows:—The egg is laid in the calyx of the apple, and hatches shortly after the young apple is found; the larva eating its way to the core, devours the pips, and makes its egress on the opposite side to which it entered. If two apples are on a bunch the larva passes from one to the other. It occasionally attacks nuts in a similar way. The imago is to be met with freely at dusk in June and July, flying round the trees.

Opadia Funebrana, Treit.—The imago of this insect is very rare, while the larva is not at all uncommon in some seasons in gardens and orchards, feeding inside plums and damsons. The imago appears in June. The larva is full fed in the autumn, when it retires to pupate, but does not accomplish the change until the following spring. In confinement they should be supplied with bits of cork, chips of bark, &c., of which they will eagerly avail themselves.

Putney, June, 1880.

(To be continued.)

STIGMONOTA SCOPARIANA, *H.-S.*: A TORTRIX NEW TO THE BRITISH FAUNA.

By J. B. Hodgkinson.

During the last week in April and first week in May I bred six specimens of a splendid Tortrix new to me, which at first sight I thought were very large *Lithocolletis ulmifoliella*. They came out of my rearing pot, in which I was breeding *Nepticula sorbiella* from the mountain ash. At first I set them down in my own mind as from queer larvæ which I got last July from the *Sorbus*, which I collected, thinking they might produce *Epigraphia Steinkellneriella*. However, when I sent both sexes to Mr. C. G. Barrett he thought there must be a mistake, as the larvæ of the genus *Stigmonota* are not cone or fruit-eaters. I at once bethought me, more especially when *Scopariana* was mentioned by the name, that I had been beating broom at the same time I was beating the *Sorbus*. This broom was a few yards from my house, at Dutton, so most likely the larvæ got mixed up. I must try this season to find more, but the broom is a very scarce plant in that district. *S. scopariana* is quite as brilliant a species as *Choreutes scintilulana*, and is a grand addition to our fauna.

Preston, Lancashire, June, 1880.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Chœrocampa nerii at Crieff. — In a small collection of British insects made by Mr. W. Grant, of Strathearn, Crieff, I find among other things, chiefly common, a very fair specimen of *C. nerii*. It was found in 1873 by Mr. Grant's gardener among some grass which he was cutting, probably about July. The owner of the specimen was aware that it was an oleander hawk, but was quite ignorant of its rarity. I have thought it worth while to send you this note as, apart from the scarcity of the species, I am informed by Dr. Buchanan White that it has never been recorded from Scotland before. — Gilbert H. Raynor; School-house, Crieff, Perthshire, June 14, 1880.

Acronycta alni.—I took a fine specimen of *A. alni*, at rest on an oak tree in Repton Shrubs, on the 12th of June.—J. E. Nowers; Burton-on-Trent.

ACRONYCTA ALNI.—On June 9th, whilst staying at Lyndhurst, I took a very fine specimen of this rare species, which I dislodged from a beech tree.—LEWIS F. HILL; 4, Craven Terrace, Ealing, June 11, 1880.

CAPTURES OF LEPIDOPTERA IN KENT.—During Whitsuntide I collected, in company with Mr. J. P. Barrett, of Peckham, in the neighbourhood of Higham, Kent. Though in the daytime the weather was fine and warm, there was a constant east wind, which made the nights very cold. Nothing whatever came to sugar, and very little indeed was on the wing. Of butterflies *Satyrus Ægeria* was plentiful in the rides, with an occasional *Anthocharis Cardamines*, *Syricthus alveolus* &c., with larvæ of *Arge Galathea* common, and *Thecla W-Album* scarce. Of moths *Corycia taminata* was common, and we got a nice series; and *Eurymene dolabraria*, *Ephyra omicronaria*, *Anticlea derivata*, *Notodonta camelina*, *Tæniocampa gracilis*, *Herminia barbalis*, and others also occurred. Amongst larvæ we were more fortunate. *Nola albulalis* was not uncommon, but still very small; and the beautiful larva of *Toxocampa pastinum* we collected full fed, commonly from *Vicia*. Those of *Pterophorus rhododactylus* were very small, and although we found one bush with plenty on, they were generally scarce, probably from the absence on most bushes of any rosebuds. Other larvæ included *Euthemonia russula*, *Ourapteryx sambucata*, *Triphæna fimbria*, freely full grown; *Epunda viminalis* in profusion on the sallows, with many other species.—GEO. T. PORRITT, Highroyd House, Huddersfield, May, 1880.

CAPTURES IN STAFFORDSHIRE.—On the 8th of this month (May) I was out insect-hunting and again captured *Epunda nigra*, a female. This makes the fourth year I have taken one in the early part of May, all females; I have not found one in the autumn. It was only just emerged from pupa, being full of a pinky juice. It was taken from a whitethorn, the same tree I took one from last year. I also captured two *Notodonta dodonæa*, the first I have taken in this district. *Noctua plecta* and *Euplexia lucipara* are plentiful and in fine condition, owing perhaps to the dry weather.—S. BRADBURY; Abbots Bromley, Staffordshire, May 24, 1880.

LITHOSIA RUBRICOLLIS IN WALES.—On May 20th, I found *L. rubricollis* at Llanrwst, in North Wales.—J. W. BENTLEY; Castleton, near Manchester, June, 1880.

Notodonta trepida in Cornwall.—When down in Cornwall last September, I caught on an oak-tree the larva of *Notodonta trepida*. It was crawling down the tree, apparently about to bury itself. The moth emerged about the 10th of this month. The place we found it was about five miles from Liskeard. This is a new locality for this species, as far as I can find out.—**William H. Kynaston**; Montpellier Lodge, Cheltenham, May 25, 1880.

Notodonta Chaonia.—I have the pleasure of recording the appearance of the above species here this season, having bred the imago from a pupa found last autumn at the foot of an oak.—**Alfred Wood**, Westmeston Place, Westmeston, Sussex.

Argyresthia ærariella bred. — From larvæ collected last August, at the Bushes, near Manchester, feeding in the berries of mountain-ash, I have just bred a series of *Argyresthia ærariella*. Plenty of *A. conjugella* are emerging, but no intermediate forms have yet appeared. *Ærariella* is certainly a species. The males and females copulate freely, but never yet have been observed to do so with *A. conjugella*. I am sorry to say that this insect is not likely to be abundant.—J. H. **Threlfall**; Preston, June 2, 1880.

Nemophora pilella.—I have turned up *Nemophora pilella* this season; I never possessed the species before. I took a fine series in a fir wood, among *Vaccinium*, on the moors above Stoneyhurst College. Some specimens I have seen doing duty in collections for *Pilella* are *Nemophora Schwarziella*. This species is totally distinct when fine specimens are seen, the hind wings being much darker than in *Schwarziella*, and the fore wings more reticulated, like *N. metaxella*, and more rounded. Let anyone who has taken the lazy *Schwarziella* take *Pilella*; he will soon find out how much more wind it takes to blow *Pilella* down into the net to box. I expect it is nearly always blowing on the high moors, so the insect has learned to be more vigorous and active, to maintain its position in nature; it also runs about in the box, like *Tinea pellionella*. There can be no doubt the larva will be a *Vaccinium* feeder. Mr. Stainton says Zeller used to take it at Glogau, in fir woods, among bilberry. Mr. Stainton also says he has seen but very few British specimens.—J. B. **Hodgkinson**; Preston, June, 1880.

Micro-lepidoptera bred this season.—From larvæ collected in Epping Forest last autumn, in April I reared from oak *Lithocolletis cramerella* and *L. quercifoliella* in plenty, but very few *L. lanantella.* From hornbeam, *L. carpinicolella* came out freely, with a few *L. tenella.* From birch, *L. ulmifoliella* and *Ornix betulævorella;* but considering the quantity of larvæ collected the number of moths have been small. From a *Lithocolletis* larva, mining the leaves of a species of wild plum, I have reared about twenty moths, which appeared different from anything I possessed. These I sent to Mr. Stainton for identification, and I quote his reply:—"I regret that I cannot determine them at all to my satisfaction; they are not *L. spinicolella;* they come nearest to some I received from Frankfort, bred from apricot." *Elachista poella* was so common on Hackney Marsh that I collected in April about a hundred pupæ one evening; and *E. nigrella = Gregsonella* swarmed about a mile from Hoe Street Station, on the roadside leading to Chingford, the middle of May. —W. Machin; 22, Argyle Road, Carlton Square, E., June, 1880.

Captures in Shetland.—Mr. E. G. Meek, with his usual enterprise, has sent one of his assistants to collect Lepidoptera, &c., in the Shetland Isles, for the whole of this season. He reports, after two months' absence, that he has captured some very beautiful varieties of *Hepialus humuli,* and also varieties of *H. velleda.* There may possibly exist a boreal species of the genus *Hepialus* in Shetland. If such is the case we may find it, on his return, amongst the *H. velleda* he mentions. As usual in our northern islands the wind and wet are the chief enemies of the entomologist, for Mr. Meek's collector had not seen a single butterfly, and only two Geometers, viz. *Eupithecia venosata* and *Larentia salicata.*—John T. Carrington; Royal Aquarium, S.W., June, 1880.

Stauropus fagi.—This season seems to have been exceptionally favourable to the production of *Stauropus fagi,* in Epping Forest and elsewhere. Mr. T. Eedle has obtained ten in five mornings' work, by searching on the trunks of beeches. A considerable number of others have also been taken at Epping, including a very dark variety of the female, taken by T. Eedle, junior. Other specimens have been bred from larvæ taken last season. Examples have also been found at Leith Hill, West Wickham, &c.—John T. Carrington; Westminster, June, 1880.

A USE OF THE HOOK TO THE TIBIÆ OF THE FORE-LEGS OF HYLOBIUS ABIETIS.—A short time ago a number of the above-mentioned weevils were sent me relatively to much harm they were doing in one locality, in Scotland; and after they had been imprisoned for some days, having nothing more suitable at hand, I placed a few specimens of half-grown spruce-galls, with young soft leaves on them, in the box with the *Hylobius* for food. They set to work greedily, and speedily cleared what was eatable; but in the case of one weevil, a soft young leaf which it had severed was crushed firmly into the end of the jaw, the piece of leaf sticking out most inconveniently behind. The weevil rubbed the extremity of the rostrum to and fro over the back of another, but this did no good, and no efforts shook the half "needle" loose, till, whether by instinct or haphazard I do not know, it applied the hook of the tibia of the left leg repeatedly, and so successfully that very shortly the piece of leaf was loosened and fell. Possibly this use of the hook is well known, but it was new to me, and was such a pretty sight I venture to offer a few lines on the subject.—E. A. ORMEROD; Spring Grove, Isleworth, W., June 1, 1880.

PHYTOMYZA LATERALIS, *Fall.*: A BENEFICENT DIPTERON.—In the spring of 1875 I had ten acres of red clover which was smothered with groundsel. In April of that year I was somewhat surprised to see a very great deal of the groundsel dying away before it seeded. Upon examination, the cause of this was found to be a small dipterous maggot feeding in the pith of the lower part of the stems. I collected many of these affected plants, and bred, about the middle of May, a quantity of the little flies, which I then sent to the late Mr. Newman, but he could not get them named. They pupated in the stems. Mr. R. H. Meade, to whom I have just lately sent a specimen, tells me it is *Phytomyza lateralis* of Fallen. I wished for its determination, as the larvæ have again appeared in some abundance. Last winter groundsel came up very thickly in some early-sown wheat; this was hoed twice, but much of the weed still lived, and it is now dying away, owing to the attacks of these little stem-feeding larvæ. Groundsel (*Senecio vulgaris*) is a troublesome weed on our good heavy land when in high condition. It is difficult to correctly determine these little Muscids; with *P. lateralis* there appears to be confusion. Kaltenbach says it lives in the stems of nettle (*Urtica dioica*), vervain (*Verbena officinalis*), and *Centaurea Jacea;* also in the seed-heads of *Chrysanthemum inodorum* (Pflanzenfeinde, pp. 339 and 387). Harris also bred it from the receptacle of the chrysanthemum, and Curtis from *Anthemis Cotula* (Brit. Ent., 393); while Bouché gives Meigen's *lateralis* as mining the leaves of hound's-tongue (*Cynoglossum officinale* and *C. furcatum*) (Stett. Ent. Zeit., viii., 143). I have found the hound's-tongue leaf-miner here, and Mr. Inchbald has bred the chamomile seed-head fly (Field, xlviii., 471; Oct 21st, 1876); but surely these are not identical with the beneficent groundsel-destroyer.—EDWARD A. FITCH; Maldon, Essex, April 27, 1880.

PEA ENEMIES.—With me the great pea-crop enemy of this year took a somewhat different form from last (*cf.* Entom. xii. 194). I had twenty acres of November-sown peas intended for early podding, and which until April looked perhaps the best crop in the neighbourhood. Throughout that month they have suffered severely from the attacks of *Tipula* larvæ. These destructive larvæ were so numerous that I frequently found four or five around the root of one pea. They completely bark the plant just at the surface, and rather below it, leaving only the woody fibre for its support. It is almost unnecessary to say how very much this attack weakens all, and completely kills many, of the plants. *Tipula* larvæ were also very abundant and destructive in the wheat this year, especially where it is after clover.—EDWARD A. FITCH; Maldon, Essex.

LARVÆ OF STRATIOMYS IN WINTER.—I do not remember ever to have seen it stated in what condition the aquatic Stratiomidæ pass the winter months. The following note on the subject may be of interest:—I have a box which, in the summer, I use as a receptacle for aquatic larvæ. I place in it, at the bottom, sand and stones and some water-weeds, and keep it filled with water. During the past winter this box was emptied and placed in a cellar, but the sand was not removed, and consequently became dry. On getting this box out, towards the end of March, I was surprised to find amongst the sand a larva of *Stratiomys*, which showed signs of vitality. On placing this larva in water I found it was alive, and it soon became sufficiently active to move the organs of its mouth with the peculiar motion characteristic of the insect when in search of food. It buried itself in the stones at the bottom, leaving only a small portion of its body exposed, and a bubble of air was attached to the aperture at the extremity of its tail. Indeed the insect seemed not to have suffered from its sojourn in the sand, where it must have lain for some three months at least. I may mention that I have seen it stated, in a standard work, that the food of these larvæ is supposed to consist of animalculæ, but it appears to me that they are vegetable feeders, subsisting upon the Confervæ which abound in stagnant pools. Perhaps some of your correspondents will inform me on this point.—Abbott G. Laker; 4, Endwell Road, Brockley Rise, Brockley, S.E., April 28, 1880.

A Successful Moth-trap.—I have been using a contrivance this season which will really repay one for the trifling trouble and expense involved in its construction. It consists first of a gallon glass jar, heavily charged with cyanide of potassium. To the top of this is fitted a funnel, the spreading mouth of which opens at right angles to the axis of the poisoned jar. The lower end of the funnel is four or five inches below the mouth of the jar, and has an opening three inches in diameter, the funnel mouth being twelve or thirteen inches across. Opposite the mouth of the funnel, and on the opposite side of the jar, is soldered to the funnel a sheet of tin so bent as to thoroughly enclose a lamp. The lamp is supported by a piece of tin hinged to the outer edge of this projection. The lamp being placed in position, the tin support is made to rest upon the projecting part of the jar below its neck. Immediately in front of the light is placed a sheet of mica. The whole contrivance is placed within a tight wooden box, and a tin flap is also arranged above the lamp chimney as a precaution against an undesired conflagration. The moth, attracted by the light, flies into the mouth of the funnel, is stopped by the mica, and, after fluttering a very short time, is so far overcome by the fumes of the potassium as to fall within the poisoned jar, whence it cannot emerge. A projecting lip of an inch or so in height is soldered to the lower edge of the mouth of the funnel in such a way as to catch any insect that falls outside the mouth of the jar. It thus is most likely to return to the light. I have taken with this contrivance hundreds of Noctuidæ and Coleoptera, among the former many things—especially among the Tineidæ—entirely new to my cabinet.—G. S. Westcott; in Annual Report of the Entomological Society of the Province of Ontario, 1879.

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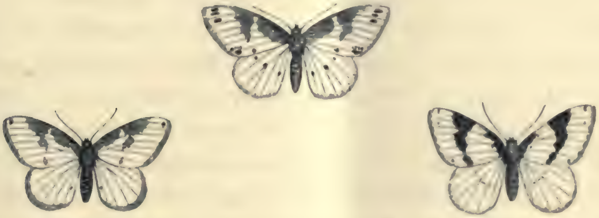
ZOMASPILIS MARGINARIA.



No. 1.

No. 2.

No. 3.

Zomaspilis marginaria.

Thinking you might like to figure some of the varieties of this very pretty and variable moth, I have selected three specimens of the light varieties. No. 1 was captured some years ago near Great Stanmore, Middlesex, by myself; No. 2, also near the same place in a swampy hollow, formerly a reservoir of water for the supply of the grounds of Cannon's Park, Little Stanmore; No. 3 was captured near Maidstone, Kent, in 1878.

Frederick Bond.

Staines, Middlesex, July, 1880.

LOCALITIES FOR BEGINNERS.

By John T. Carrington, F.L.S.

No. VIII.—WICKEN.

For the entomologist who is not afraid of work, and who is no mere dilettante, "The Fens" probably afford the richest of all localities for Lepidoptera in this country. Amongst fen-lands, Wicken still retains its virgin soil and flora, unspoilt by drainage or cultivation. It is there every beginner may see that most beautiful of our butterflies, *Papilio Machaon*, in a state of nature. To those who are denied the opportunities of seeing the diurnal Lepidoptera of the tropics, it is some consolation to observe this handsome creature sailing along, or sunning itself on some uncommon marsh flower. Such a sight cannot fail to give pleasure to one with an appreciation of nature, whether he be entomologist or botanist.

Wicken Fen is to be found near the north bank of the River Cam, some fifteen or sixteen miles below Cambridge, and near to the small village of Upware. The best way to get from London is by Great Eastern Railway to Waterbeach Station, which is a little distance after passing Cambridge. We are then some five miles from Wicken Fen; but we have taken the precaution to write to Mr. William Denson, mine host of the little inn at Upware, bearing the odd sign of "Five Miles from Anywhere." We have written with the primary object of securing one or two of the limited number of beds to be there obtained; and, secondly, to ask him to meet the train with his conveyance that he may drive us and our luggage to his hospitable house. To one who has never before visited the fens, this drive is of interest, for it is through a most characteristic piece of cultivated fen-land, which has been reclaimed from what must have been at one time a very extensive tract of marsh. Wide and deep ditches are on each side of the road, while beyond is a broad expanse of perfectly flat landscape, relieved only by clumps and rows of tall poplar trees to be seen here and there in the distance. It is well we are riding, for the long straight roads, with such monotonous scenery, would sadly discourage a pedestrian. In about an hour we are at our journey's end, and, after the adventure of all being ferried across the river, we find Mrs. Denson awaiting us with a savoury and thoroughly country dinner, for which our long journey has prepared us.

Naturally our first question on arrival is about Wicken Fen. It is pointed out to us, and, from a little distance, appears like a brown overgrown meadow. We start away to our work and take the road from the river, and, passing a few houses, we come to some ash trees on our right. These are quite historical in entomologists' annals. About 1850 it was here Mr. Bond took at sugar *Acronycta strigosa*, in company with *Cidaria sagittata*, both at that time very rare; and, flying over the oats just over the fence, he also took the then new *Cosmopteryx Lienigiella.* In the same field he also took the very rare *Argyrolepia Schreibersiana,* and, for the first time, discovered *Eupithecia viminata,* then supposed to feed upon osiers (*Salix viminalis*), but now known to feed on the flowers of the *Valerian.* Passing these ash trees we come to a gate leading on to a wide bank; following this we arrive at a small pumping-engine, and opposite this we may cross the ditch into the fen proper.

On entering the fen we find that our first impression of a brown meadow gives way to a more pleasant one, when we see that the growth consists of many marsh plants seldom found in such abundance. Conspicuous amongst these are sedges, reeds, yellow iris (*Iris pseudo-acorus*), yellow loosestrife (*Lysimachia vulgaris*), purple loosestrife (*Lythrum salicaria*), comfrey (*Symphytum officinale*), meadow-sweet (*Spiræa ulmaria*), meadow rue (*Thalictrum flavum*), dwarf sallows, and hog's-fennel (*Peucedanum palustre*), the food-plant of *Papilio Machaon* larvæ. In addition to these plants are several rarer and interesting species, especially of the genus *Ranunculus.* As may be understood, the fen is frequently very wet, even in summer during some seasons. It is intersected with deep ditches, and surrounded by broader dykes, locally known as "loads." On these may be seen the long narrow fen-boats laden with peat for fuel or with cut and dried sedge, which is used in the district for bedding for cattle or for thatching. The total extent of Wicken Fen is about three miles long by one mile broad.

Should we, on our visit, have the bad luck to meet with wet or windy weather we shall fare badly with our captures. There is no shelter from the wind, which sweeps across the broad expanse of country with such force as to make flight impossible for all but the strongest insects. Should we, however, be more favoured with a warm sunny day any time between the end of June and end of July, we shall soon get a sight of the beautiful "swallow-tail" butterflies.

When perfect insects are scarce we shall find plenty to occupy us at the various times of the summer season with looking for larvæ. I will name a few of the many species we may expect, although, of course, not all at once, but each in its turn, which may be easily ascertained. On the sedges *Orgyia cœnosa* used to occur sometimes in abundance, but of late years it seems to have become very rare; last season, only one specimen being noticed so far as I can ascertain from those who visited the fen. In June and July the larvæ of various *Leucanidæ* may be found at night on the reeds (*Phragmites communis*); those of *L. pudorina* not being uncommon. The perfect insects of this genus are sometimes in great abundance, flying over the herbage after dusk later in the season. In the stems of the reeds the larvæ of *Macrogaster arundinis* feed with those of *Leucania phragmitidis* and *Chilo phragmitellus*. A good way of collecting the imagines of these species is to examine the freshly-cut reed and sedge stalks at night with a lantern. They are then often found just after emerging from the pupa-cases. This applies to other species, such as the scarce and variable *Senta ulvæ*, although at another period of summer. *Callimorpha dominula* is another curious case of an abundant insect becoming rare in this locality. A few years ago it was common at Wicken; the larvæ could be found in spring feeding upon almost every species of plant growing there, but apparently most preferring the meadow-sweet. It is now no longer common; in fact, in some seasons, being quite scarce. In June the larvæ of *Chelonia caja* abound upon the comfrey; a large number may be taken on a single sunny morning. On the bedstraw (*Galium*) *Chærocampa elpenor* may be found also as a larva, while upon the sedge, *Simyra venosa* is frequently in numbers. *Sesia bembeciformis* may be found boring the sallow stems, and the great fat larvæ of *Lasiocampa quercifolia* stick closely under blackthorn stems by day. *Saturnia carpini* are common on meadow-sweet and sallow in early autumn. All the larvæ mentioned should be collected, if possible, for many fine varieties have been bred from the fen-lands.

During the last few seasons the chief mode of collecting Lepidoptera in the fens has been with light. This has been found by far the most successful means used for making large "bags" of rare and local species which could not be allured by the charms of "sugar," or indeed any other bait. The way to proceed is to get a "lighthouse," which may be obtained at one of the shops where we buy our other entomological apparatus. It consists of a glass case some two feet square affixed on a pole about six feet high. In this glass case are placed two or four paraffin lamps, as large as can be conveniently managed. These lamps are lighted when the darkness of night has set in. After we have placed our lighthouse in a conspicuous place which will command a good area of the fen, behind our lighthouse, or more correctly, to windward, we must spread a sheet stretched on two poles. This has a double advantage of sheltering our lamps from the wind, while at the same time it forms to some extent a reflector and convenient background on which to see any specimens which fly past the lantern. Having selected our ground and got all in order we light our lamps. At the same time it will be as well to light our pipes, and, if we can also muster some "yarn" about the great catches of other people, it may encourage us, for we must not expect all the good things in the first hour. Watching a light for Lepidoptera is a fine exercise for our patience. We may have to wait an hour—even two, three, or more hours—before our first insect appears; on some nights indeed our visitors do not come at all. But when they do come, as said the historian of John Gilpin,

"May I be there to see."

Nearly all groups of Lepidoptera have been known to visit the light in a single night, even butterflies. The rule for such a night seems little understood as yet, and we can recommend no better subject for the study of our readers. An apparently good night frequently produces little or nothing, while sometimes those collectors who have had the patience or perseverance to stay through a wet and windy night find that suddenly the moths begin to come, and many rarities are unexpectedly taken. Lights may be successfully used the whole summer through, when the nights are favourable. Amongst the many insects to be taken are the rare *Hydrilla palustris*, which, until so attracted, was a species represented by single specimens in one or two collections only. *Meliana flammea* and *Nascia cilialis* were almost as rare, but have since appeared in most of the best collections, if only in some cases as types. Amongst the more plebeian herd are the pretty *Bankia argentula* and *Hydrelia unca;* while at times *Apamea unanimis* and *A. fibrosa* abound, with an occasional *Macrogaster arundinis* or *Simyra venosa*, and crowds of *Phibalapteryx lignata*. In addition to these we get on a good night many strange and uninvited guests, such as bats, beetles, flies, with numbers of *Chelonia caja*, which flounder about and drive away our more aristocratic visitors. Enough I think has from time to time been said and written on the subject of light in the fens to show its success. I need, therefore, simply wish that our reader may on his visit to Wicken have the good fortune to see a "real night for light," and hope he may use his time to good advantage.

Sugar has latterly been somewhat at a discount amongst collectors at Wicken, but at times it produces a rich harvest. There are several clumps or rows of poplar trees near Upware on either side of the river. These may be often found very profitable if sugared. These trees do not stand in the fen itself, but are surrounded by dykes and fenny land in every direction. At these trees, when sugared, have been taken all the following and many other species:—*Acronycta strigosa*, *Cymatophora ocularis*, sometimes a dozen in a single night, *Apamea ophiogramma*, *A. fibrosa*, *Hadena atriplicis*, *H. suasa*, &c. A sharp look-out should always be kept for the exceedingly rare *Hadena satura*, which might be overlooked for an odd *H. thalassina*. One of the very limited number of places where this great rarity was taken was in Cambridgeshire. Many of the commoner Noctuæ taken at sugar in the fens are well worth looking over, for many odd forms appear amongst them from time to time. These bear examination from other views beyond those of the mere collector, and are curious to those who study development of varieties or types as associated with surrounding circumstances.

I have already mentioned a couple of nearly extinct species which used to occur commonly at Wicken. Space will not now permit us to discuss the causes which have led to this apparent extermination of certain species in certain localities. I must not, however, forget to remind our readers that at one time the now rare *Phibalapteryx polygrammata* used to occur between Upware and Wicken villages in some abundance. Mr. Bond informs me that at one time he could have taken large numbers in Burwell Fen, which was immediately south-east of Wicken Fen and adjoining. *P. polygrammata* was also taken in Wicken, but more sparingly than in Burwell. There were two broods, one in April and the other in June, and, like its relative, *P. lignata*, the summer form was the larger. Not for years has this species been seen, although carefully searched for by many collectors. Burwell Fen, the headquarters of this insect, has been drained, and is under a rough kind of cultivation, but Wicken still remains, and only separated by a twenty-foot dyke, known as Burwell Load. The moth may turn up again, and is always worth looking for.

Amongst the most striking of our Geometers to be found at Wicken is *Cidaria sagittata.* The larvæ may be found on the seeds of the meadow rue in August, frequently in goodly numbers. The pretty *Hyria auroraria* is sometimes not uncommon, neither are the two "pugs," *Eupithecia subumbrata* and *E. pygmæata.*

Wicken is a grand field for the student of the British Tortrices. Many are the local and rare species he may take there during a short summer holiday, either as imagines or in the larval condition. As an example I may mention *Tortrix dumetana, T. costana, Peronea hastiana,* with some beautiful and curious varieties. The larvæ of *P. Shepherdana* are found along with those of *P. aspersana* in rolled-up leaves of the meadow-sweet in June, and will repay the trouble spent upon collecting them. The imagines of these species are found sitting upon the leaves of that plant commonly in August. Another local species is *Dictyopteryx uliginosana,* which is double-brooded, and appears in June and September. In June, also, may be found, but not commonly, *Penthina carbonana,* while *Sericoris herbana* is taken in July with *S. micana* and *Phoxopteryx paludana* in June and August, and many others.

Of the plumes, *Pterophorus bipunctidactylus, P. lithodactylus, P. microdactylus,* and the very rare *P. paludum* are represented. The latter is seldom taken, but is possibly overlooked, being a small and obscure species.

That large division of the Lepidoptera, the Tineina, is especially favoured at Wicken. Many rare and some new species may still, no doubt, be found. The genus *Depressaria* is rich in its members. The strikingly black and white *Anesychia funerella* is not known to occur elsewhere in this kingdom ; it is frequently found in some numbers. So conspicuous a lepidopteron must have greatly pleased its re-discoverers, Dr. Bree and Mr. Bond, when first found by them. The genus *Gelechia* will alone well occupy much of one's time at Wicken, if we wish to succeed in obtaining a better knowledge of its species. One has been latterly added to the British list from that fen, namely, *Gelechia marosa.* Other rarities to be found there are *Laverna phragmitella,* which feeds in the seed-heads of the reed-mace (*Typha latifolia*). An interesting figure is given in Mr. Stainton's beautiful work, 'The Natural History of the Tineina' (vol. xi.). *Cosmopteryx orichalcella* is to be taken amongst the fescue-grass (*Festuca pratensis*), and will repay a diligent search. Space will not permit of a further list of Lepidoptera to be taken at Wicken, but I can confidently predict many pleasant surprises in store for the hard worker who has never before been to the fens.

My experience of Wicken this year was confined to a visit of two days early in June, in company with Mr. Meek, who kindly showed me the localities in the fen for many of the best species. The weather was of the most unfortunate character a collector could well meet with; the rain was frequent and heavy, and the wind was constant. The result was that we did not take a single lepidopterous imago in the fen, but our trouble in collecting various larvæ was well repaid. I bred some very fine *Peronea hastiana*, with some of the rarer varieties. This species must, I think, be double-brooded, for my specimens were all out and set by the end of June. This is confirmed by other correspondents who have also bred it during the summer. At sugar we found many Noctuæ, but none of the rarer species.

To the lot of few of us does it now occur to take several species new to our fauna in one season, but such was the case when Mr. Bond went to Wicken for the first time. This was, as I have already said, about 1850. In that year he added to the British list, I believe, *Schœnobius mucronellus*, *Anesychia funerella*, which was only doubtfully British; *Nascia cilialis*, which had not occurred for thirty years before. In fact, I believe Mr. Bond, who then lived at Cambridge, was the first entomologist who worked this fen with system, at any rate. He was frequently assisted by a man who lived at Fulbourne named Osborne. Mr. Doubleday used to have most of Osborne's Lepidoptera, and Mr. Wollaston his Coleoptera. All the fen species were rare in those days, and the application of light was not used as an attraction for moths.

Before closing this article I should say that another way to go to Wicken Fen is by Wicken village. This is reached from Soham Station on the Newmarket and Ely Railway; but Wicken village is some distance from the station. Accommodation may sometimes be obtained there, but I prefer the Waterbeach and Upware route, on account of its being a shorter railway journey from London, and, still better, you get a hearty welcome from the host of the "Five Miles from Anywhere," who has for many years been used to the eccentricities of entomologists, and who can tell them where to work for many species. Whichever way is chosen, it is well to write first to see if a bed can be obtained, for the visitor must not expect to find a "grand hotel" with an unlimited number of apartments near Wicken Fen.

Royal Aquarium, Westminster, July, 1880.

A FEW REMARKS UPON CERTAIN DIPTEROUS INSECTS.

By R. H. Meade.

Having spent a few days towards the latter end of last June in Buckinghamshire and the neighbouring parts of Oxfordshire, I am induced to make a few remarks upon some interesting Dipterons which I noticed in those localities. This order is so extensive that I shall confine my observations almost exclusively to the members of one family, the *Anthomyiidæ*, which are very interesting, though they have received but little attention.

The first species to which I shall allude is *Ophyra anthrax*, Mgn. On a hawthorn hedge by the side of the road, on the outskirts of the town of Buckingham, I found this little blue-black fly in immense numbers. Some years ago I noticed it before in the same place, but I have never seen it in any other locality, though I have looked for it in various parts of England. Nearly opposite to the hedge in question, on the other side of the road, there is a bone-mill, in which bones are ground up for manure; and I noticed that a very strong putrescent odour emanated from it. This smell evidently attracted the flies, for they were most numerous on that end of the hedge which was nearest to the mill. This peculiar species seemed to have almost exclusive possession of the locality, for, with the exception of a very few individuals belonging to the larger species of the same genus (*Ophyra leucostoma*, Fall.), I noticed no other flies among them. On referring to the accounts given of this species by systematic authors I found, in Schiner's 'Fauna Austriaca' (Diptera), the remark that it is of local occurrence, and that he once found it in countless numbers ("in wahrer Unzahl") near a dead horse. What is the source of attraction? Do the larvæ feed upon carrion? The flies I saw were almost all of the male sex; out of fifty which I captured only two or three were females.

After leaving Buckingham I stayed for several days in a retired country parsonage within the borders of Oxfordshire, and I found the garden, shrubbery, and immediately surrounding country very rich in rare and interesting species of Anthomyiidæ. A dry enumeration of the names of those which I captured would be of little interest, so I will only mention those which are particularly rare, or peculiar in their habits.

Under a large standard apple tree in the kitchen garden I noticed, on a sunny day following a wet morning, a number of *Homalomyias* performing a joyous aërial dance, such as all the flies belonging to this genus are fond of doing. Upon watching them I observed that they were of three distinct kinds and sizes; some were small and grey in colour, others rather larger and blacker; and, darting between these, and glistening in the stray beams of sunshine which stole through the leaves of the tree, were a few individuals of a still larger size and brighter colour sporting with the rest. I captured one or two of each kind with my forceps, and found them to be *H. canicularis*, Lin., *H. scalaris*, Mgn., and *H. aprica*, Hal. The two former are common everywhere indoors and out, but the last, which is the largest species in the genus, must be considered rather rare, though it is widely distributed. The interest here attaches to the circumstance that three distinct species were sporting and associating together. Is this usual? As I believe is always the case, the flies performing this dance were all males.

Pyezura pardalina.—On a shrub in the garden I captured a rare Dipteron closely allied to the *Homalomyias*, but placed in a separate genus by its discoverer, Prof. Rondani, who named it *P. pardalina*. It differs from the *Homalomyias* by having a plumose instead of a bare arista on the antennæ. This little fly has hitherto only been recorded as a native of Italy, not being mentioned in any of the works I have seen on the Diptera of France, Germany, or Scandinavia, as well as England. I am sorry to say I only found a single male specimen, though I carefully searched for others.

Hyctodesia (*Aricia*) *abdominalis*, Zett., and *Hydrostæa velutina*, Desv.—I will only mention these two other Anthomyids, both of which I found. Both are rare; the former is recorded by Walker as British, but I had not previously seen it; the latter has not been found before in England to my knowledge, and is very rare on the Continent.

In conclusion, the only fly belonging to another family to which I shall allude is the *Morellia* (*Cyrtoneura*) *curvipes*, Macq. I had formerly captured several males of this rather rare Muscid in the same neighbourhood, but on the present occasion I found numbers of both males and females (the latter I had not previously seen) on the leaves of strawberry plants in the garden.

Bradford, Yorks, July, 1880.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

By J. B. Bridgman and E. A. Fitch.

No. II.—ICHNEUMONIDÆ (*continued*).

Section 5.—Scutellum and abdomen black; apex reddish or fulvous. Tarsi and tibiæ yellow (B) or saffron (A), apex of hind one black.

A. Intermediate segments of abdomen rufo-fulvous at the sides.
122. *dubitatus*, 6 lines.

B. Intermediate segments not so marked.
111. *ancipiterus*, 6—6½ lines.

Section 6.—Scutellum pale; abdomen red and black; apex with white or whitish marks.(¹)

A. Middle area of post-petiole aciculate; supero-medial area of metathorax rectangular or subquadrate (females).

Subdivision I.—Antennæ filiform or the apex slightly attenuated, rather stout, after death involuted; mesothorax a little higher than the metathorax.

Scutellum white or yellowish.

a. Hind coxæ pubescent beneath.

* 2nd and 3rd segments either entirely red, red and black, or sometimes quite black; tibiæ, especially the hinder ones, reddish at the base; femora black. 30. *computatorius*, 6—9 lines (*a*).

** 2nd and 3rd segments, the latter with a black basal band and hinder femur, red; apex black, and tibiæ the same.
32. *vaginatorius*, 5—6 lines.

*** 2nd and 3rd segments red; hinder tibiæ with a wide straw-coloured band in the middle. 34. *confusorius*, 5—7 lines (*a*).

b. Hind coxæ not pubescent beneath; greater part of the femora black, especially the hinder ones.

(¹) Generally it is the last two or three segments that are pale marked, sometimes the last four, and sometimes only the last: these marks often vary in the same species

† Margins of cheeks descending more or less below the base of the mandibles; 2nd and 3rd segments of abdomen red.

‡ Tarsi and tibiæ red; apex of hinder one black.

§ Scutellum white. - - - 35. *bucculentus*, 6—9 lines (*a*).

§§ Scutellum whitish yellow. - 37. *gracilentus*, 5—6 lines.

‡‡ Tibiæ whitish straw, apex of front one red-brown, apex of hind one black. - - . - 36. *suspiciosus*, 6—9 lines (*a*).

†† Margins of cheeks not dilated below the base of the mandibles. 2nd and 3rd abdominal segments red.

× Hind tibiæ in the middle straw or whitish straw-coloured.

* 3rd segment with a short black basal band.
38. *terminatorius*, 6—9 lines.

** 3rd segment with the black band; this and the 2nd, chestnut marked with black, or entirely black.
39. *melanotis*, 7—8 lines (*a*).

× × Hind tibiæ red or reddish straw-coloured at the base.

* 1st to 3rd abdominal segments red. - 46. *multipictus*, 3 lines.

** 2nd and 3rd segments red, 4th sometimes partly so.
42. *luctatorius*, 6—8 lines.

× × × Hind tibiæ black. - - 43. *militaris*, nearly 4 lines.

Subdivision II.—Antennæ setaceous, after death incurved or subinvoluted, apex distinctly attenuated; mesothorax and scutellum generally much higher than the metathorax; hinder coxæ not pubescent beneath; 2nd and 3rd abdominal segments red, the 3rd in both sexes generally transverse.

a. Scutellum yellowish or white.

* Gastrocœli of 2nd segment of the abdomen rather large, the space between them equal to the width, or only a trifle wider than the middle area of the post-petiole.

† Femora black.

‡ Spot on coxæ and base of tibiæ yellowish, especially the hinder one.
48. *primatorius*, 10—11 lines.

‡‡ Tibiæ red, apex of hinder one and coxæ black.
53. *formosus*, 5½ lines.

†† Greater part of femora red.

§ Hind knees black. - - 50. *gracilicornis*, 4—5½ lines (*a*).

§§ Hind knees not black.

× Middle area of metathorax subquadrate.
52. *quadrialbatus*, 4—5 lines.

× × Middle area of metathorax wider than long. 49. *bellipes*, 7½ lines.

** Gastrocœli of the 2nd segment smaller, the space between them wide, mostly wider than the middle area of the post-petiole.

– 2nd and 3rd abdominal segments red.

o Tibiæ red, yellow in the middle. 54. *caloscelus*, 5—6 lines (*a*).

oo Tibiæ red, apex of hinder one black.

· · From the base of 2nd segment to the apex of the 5th the sides are parallel. - - - - 56. *subcylindricus*, 6 lines.

· · · · Abdomen not thus narrowed in the middle.

– Upper margin of the collar sordid white. 55. *cædator*, 4—4½ lines.

∽∽ Collar not pale marked; apex of 1st segment frequently red.
57. *raptorius*, 3½—5 lines (*a*).
++ 1st to 3rd abdominal segments reddish; 5th, 6th, 7th (or 6th and 7th) marked with white.
* Basal segments dark brown. - 29. *punctus*, 4½—5⅓ lines (*l*).
** Basal segments red. - - - 59. *rufidens*, 4 lines.
b. Scutellum more or less, and 1st—3rd abdominal segments, red.
vulneratorius, 3¼—4 lines (*h, t, l*).
B. Middle area of post-petiole strongly punctured (females).
Gastrocæli of 2nd abdominal segment small, the space between them wider than the middle area of the post-petiole.
Segments 1—3 and sometimes 4 more or less red, apex as well as sometimes the petiole black; 6 and 7 or 5—7 white marked; greater part of legs generally red.
a. Vertical orbits black. - - 90. *lepidus*, 4—6 lines (*a, l*).
b. Vertical orbits marked with red. 88. *vestigator*, 4—5 lines (*l, a*).
c. Vertical orbits whitish.
* 4th abdominal segment without white apical fascia.
† 3 superior areas on the metathorax. 94. *callicerus*, 3½—4 lines.
†† 5 superior areas on the metathorax; femora black.
97. *bilunulatus*, 2½—4 lines (*s*).
** 4th—7th abdominal segments with white apical mark; front, and base of hind, tibiæ red. - - 95. *angustatus*, 4½ lines.
C. Middle area of post-petiole smooth (females).
a. 1st—4th abdominal segments red; 6th and 7th white on the back; femora and tibiæ red, apex of hind black.
104. *ridibundus*, 3—4 lines (*f, t, l*).
b. 2nd—6th segments towards the apex red; hind coxæ beneath with several raised lines; legs varied with brown and pale.
76. *varipes*, 2—3½ lines (*s, l, a*).
A. Middle area of post-petiole aciculate (males).
2nd and 3rd segments of abdomen entirely red; sometimes (*a*) more or less spotted or marked with or (**) almost entirely black; femora dark, tibiæ partly red.
a. Scutellum and marks on the face, thorax, and abdomen white.
* 2nd and 3rd segments without punctures.
58. *septemguttatus*, 6 lines.
** Abdomen closely and finely punctured.
29. *punctus*, 5—6 lines (*l, a*).
b. Scutellum and marks on the face, thorax, and abdomen whitish or yellowish.
3rd segment transverse. 50. *gracilicornis*, 6—8 lines (*h, s, a*).
B. Middle area of post-petiole punctated (males).
Gastrocæli small; 1st—3rd abdominal segments red; petiole more or less black; apical segments white-marked.
a. Vertical orbits not marked with white.
90. *lepidus*, 4—6 lines (*h, l, a*).
b. Vertical orbits marked with white.
* Stigma fuscous, base pale. - 89. *chionomus*, 3—3½ lines.
** Stigma not pale at the base.
† 1st segment of abdomen black, and nearly the whole of the legs.
‡ Scutellum with 2 apical spots sometimes confluent.
92. *octoguttatus*, 4—6 lines.

‡ Scutellum white. - - 95. *angustatus*, 3½—4 lines (*a*).
(Wesmael says the abdomen is a little more thickly punctated than in *vestigator*.)

‡‡ Post-petiole more or less red.

§ Metathorax with 5 superior areas.
88. *vestigator*, 4—5 lines (*h*, *t*, *l*.)

§§ Metathorax with 3 superior areas.
94. *callicerus*, 3½—4 lines (*l*, *a*.)

C. Middle area of post-petiole smooth (males).

a. 2nd—5th abdominal segments red, 6th—7th white
104. *ridibundus*, 3—4 lines (*h*, *l*, *a*.)

b. Margin of middle segments red or piceous.
76. *varipes*, 2—3½ lines (*l*.)

Doubtful species; structure not described

A. Females.

1. Scutellum fulvous; ring of antennæ reddish yellow; tibiæ red, apex of hinder one black.
Segments 2 and 3 tawny red; 5, 6, 7 marked with white.
125. *fulvoscutellatus*, 6 lines.

2. Scutellum white or whitish.
Segments pale saffron, remainder each with a large triangular white spot; legs red; knees, hind tarsi, and apex of hind tibiæ black. - - - - 139. *quadrinotatus*, 4 lines.

3. Segments 2 and 3 red, base of 3rd black; apex of last 3 segments with a white spot; tibiæ yellow; apex of hinder black; vertical orbits of eyes pale. 117. *concinnatorius*, 7 lines.

B. Males.

* Antennæ black.
Femora, tibiæ, 2nd and 3rd segments of abdomen, red; sides of 4th—6th glaucous, 7th with a dorsal macula of the same colour - - - - - 127. *interruptus*, 6 lines.

** Antennæ with white marks in the centre.
2nd—4th abdominal segments chestnut; 6th—7th whitish yellow; greater part of legs black, front ones partly pale.
118. *cubicularis*, 3½ lines.

SECTION 7.—Scutellum black; abdomen red and black; apex pale marked.

A. Head black, orbits not pale; in *analis* with a thin red line (females).

Antennæ tricoloured; abdomen red; apex black, marked with white.

a. Legs (including coxæ) red, apex of hinder black, middle area of post-petiole aciculate. - . 45. *latrator*, 2½—3½ lines.

b. Tibiæ red, apex of hinder black, middle area of post-petiole with no sculpture. - - - - 47. *spurius*, 2½ lines.

B. Head with the orbits more or less pale (females).

* 1st abdominal segment entirely black; greater part of legs dark.

† 2nd and 3rd segments more or less sordid chestnut.
65 *gemellus*, 5½—7 lines.

†† 2nd—4th segments chestnut red. - 118. *cubicularis*, 3½ lines.

** 1st and 4th segments more or less red, 2nd and 3rd entirely so.

‡ Hind femora red. - - 89. *chionomus*, 2¾—3¼ lines.
‡‡ Hind femora black.
c. Middle area of post-petiole punctated.
§ Gastrocæli distinct. - - - 92. *octoguttatus*, 5—6 lines.
§§ Gastrocæli obsolete. - - - 96. *derogator*, 4 lines.
d. Middle area of post-petiole finely aciculate. 66. *analis*, 3—3½ lines.
C. Antennæ white-ringed; 2nd and 3rd abdominal segments red, 5th, 6th, 7th white; tibiæ testaceous; post-petiole aciculate (male). - - - - - - 53. *formosus*, 6 lines.

(To be continued.)

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Variety Iole of Apatura Iris.—Last week, while spending a few days in Sussex, I had the good fortune to add to my collection the variety of *Apatura Iris* named *Iole*. As usual, the good luck of capturing a variety fell to a beginner, who, although taking but three specimens of *Iris*, took this variety settled low down on a small oak. Upon learning the rarity of his capture Mr. Percy Eley kindly gave it to me. *Iris* was tolerably common, and if I can only induce the female I have to deposit eggs, I trust I may be able to rear some imagos next season. As I was not seriously bent on collecting I caught but few species. *Pionea stramentalis* was very common. I have met with this species often before, but never saw it in such numbers; it was flying in company with *Ebulea crocealis*. Among other species I saw *Aventia flexula*, *Cleora lichenaria*, *Macaria notata*, *Scotosia undulata*, *Dichelia Grotiana*, &c. In midday, with the sun shining hotly, I caught a female of *Zeuzera æsculi* flying high up over beech trees. I watched it some time (before it came within reach) flying over the dense wood, and was much puzzled by its appearance. On the golden-rod were larvæ of *Cucullia asteris*, but a careful search did not result in the finding of that of *Cucullia gnaphalii*.—A. B. Farn; Dartford, July 23, 1880.

A Week in the New Forest.—On the 10th of this month I went to Lyndhurst for a week's collecting. Strange to say, there were very few entomologists in the New Forest, possibly on account of its being apparently a bad season; the local collectors state they do not remember such a bad one for some years. Sugaring was of little or no use, only producing some half a dozen worn *Leucania turca*, two *Diphthera Orion*, *Thyatira batis*, *Euplexia* *lucipara*, and a few common insects; in the daytime I took *Boarmia roboraria*, *B. repandata* var. *conversaria*, *Tephrosia biundularia*, *Lithosia mesomella*, *Zygæna loniceræ*, *Lycæna Ægon*, *Euthemonia russula*, *Metrocampa margaritaria*, *Limenitis Sibylla*, *Argynnis Adippe*, and a nice series of *A. Paphia*, including a fine specimen of the var. *Valezina*; at dusk, *Cleora viduaria*, *Melanthia albicillata*, *Ypsipetes elutata*, *Pseudopterpna cytisaria*, and many other Geometræ. I also saw taken by a young lady, a fine female *Apatura Iris* just emerged, the empty pupa-case sticking to a rush, on which the larva had spun up, having probably fallen when full-fed from a sallow bush close by. A few things only came to light, *Agrotis porphyrea*, *Notodonta camelina*, *Caradrina blanda*, and *Chelonia caja* being amongst them. Beating yielded some good larvæ—*Notodonta chaonia*, *N. dodonæa*, *N. trepida*, *Liparis monacha*, *Amphydasis prodromaria*, *A. betularia*, *Boarmia consortaria*, and many others "too numerous to mention," *Tæniocampa stabilis* being a perfect pest. I also saw a half-grown larva of *Acronycta alni* beaten out. By tree-trunk searching I obtained pupæ of *Lithosia quadra*, *Liparis monacha*, and *L. chrysorrhœa*. On the 17th inst. I returned to London, having done a fairly good week's collecting. One of the most curious things in connection with this season is that many pupæ appear to be standing over. I have in my cages *Smerinthus ocellatus*, *S. tiliæ*, *Bombyx callunæ*, and *Saturnia carpini*. Many larvæ, such as *Triphæna fimbria*, were common enough in the spring, and now no imagos seem to be about, or only very few. I may remark *en passant* that at the "Crown and Stirrup," at which I stopped, the entomologist is made welcome, and the house certainly is one of the most comfortable and moderate in its prices of any place at which I have made a stay.—P. J. Lowrey; 61, Hackford Road, S.W., July 21, 1880.

Lepidoptera at Wicken.—From June 14th to 26th last, I spent at Wicken, collecting Lepidoptera, in company with the Rev. T. W. Daltry, M.A., of Madeley, and several other friends. The weather was not favourable for fen work—north-east winds the first week were followed by very much rain in the second. *Papilio Machaon* was plentiful on the few sunny days we had, and its eggs were also tolerably easy to find on the upper side of the leaves of *Peucedanum palustre*. *Macrogaster arundinis* and *Meliana flammea* were taken sparingly most nights at our lamps, and I took a fine female of the latter at sugar. That is not usually a habit of the species, so its presence in this case may have been more by accident than otherwise. The three moths most abundant were apparently *Apamea unanimis*, *A. gemina*, and *Chilo phragmitellus; A. unanimis* occurred in thousands all over the fen. Of *C. phragmitellus* we also found larvæ and pupæ in the old reed stems. Other species taken or noticed included *Anthocharis cardamines*, hybernated *Gonepteryx rhamni*, and *Vanessa cardui*, commonly; *Smerinthus ocellatus*, *S. populi*, *Sphinx ligustri*, *Chœrocampa elpenor*, were not uncommon; *Sesia myopæformis*, *Arctia fuliginosa*, at the lights at night, also not uncommonly; *Arctia urticæ*, *Liparis salicis*, larvæ on sallows; *Pœcilocampa populi*, I beat a larva out of elm in the wood; *Lasiocampa quercifolia*, full-grown larvæ rather common on buckthorn, &c; *Saturnia carpini*, young larvæ; *Epione apiciaria*, common; *Asthena luteata*, *Eupithecia pygmæata*, and several more common "Pugs;" *Collix sparsata* in fine condition; *Lobophora sexalata*, *Coremia ferrugata*, *C. unidentaria*, *Phibalapteryx lignata*, common, and much larger than specimens of the second brood I took there at end of July and beginning of August two years ago. *Dicranura furcula*, *D. vinula*, *Ptilodontis palpina*, not uncommon; *Notodonta ziczac*, *Acronycta aceris*, *Simyra venosa*, tolerably common; *Leucania pudorina*, *L. comma*, *Mamestra anceps*, a few at sugar; *Rusina tenebrosa*, *Noctua augur*, *N. plecta*, *N. rubi*, *Hecatera serena*, *Aplecta advena*, *Hadena atriplicis*, *H. suasa*, several of each at sugar; *Hydrelia unca*, moderately common, and in good condition; *Plusia chrysitis*, *Herminia cribralis*, common and fine; *Nascia cilialis*, about a dozen specimens were taken during our stay, but eight of them occurred late one night after Mr. Daltry and I had left the fen on account of heavy rain; *Paraponyx stratiotalis*, abundant; *Halias clorana*, flying at dusk; *Peronea Shepherdana*, larvæ plentiful; *Anesychia funerella*, *Pterophorus microdactylus*, and many other micros.—GEO. T. PORRITT; Highroyd House, Huddersfield, July 8, 1880.

LEPIDOPTERA AT HORNING FEN. — In company with Mr. E. G. Meek I visited Horning Fen, in Norfolk, on the 23rd and 24th of this month. Although the weather was fairly suitable the absence of the perfect insects of Lepidoptera was most marked. Where, in most seasons, many fen species may be found in profusion, next to nothing was to be seen. Our captures did not exceed half a dozen species, and, with the exception of three specimens of *Apamea ophiogramma*, were those only which are commonly taken there.—JOHN T. CARRINGTON; Royal Aquarium, July, 1880.

VARIETIES OF LIMENITIS SIBYLLA AND ARGYNNIS PAPHIA IN THE NEW FOREST.—While stopping at Brockenhurst I captured on July 5th a black variety of *L. sibylla* in good condition, and on the 17th I caught a male specimen of *A. Paphia* settled on a thistle-head in one of the rides, which on examination I found had a small white patch on each of the fore wings, which is repeated, but not so distinctly, in the hind wings. I believe this variety is of uncommon occurrence.—ARTHUR J. ROSE; Mutlah Lodge, College Avenue, Hackney.

PUPÆ OF THECLA QUERCUS EMITTING SOUND.—A few days ago, while holding several pupæ of *Thecla quercus* in my hand, I was surprised to hear some of them squeak. The sound they produced was something like two stones or marbles being knocked together in rapid succession, with an occasional louder sound. As soon as the sound ceased, a gentle shake set them squeaking again.—H. MACRAE PARISH; Ashfield House, Taunton, July 17, 1880.

VARIETY OF SATYRUS JANIRA.—On July 15th I caught a variety of *Satyrus Janira*, a male. It has a large whitish spot at the tip of the right fore wing, occupying nearly a third of the wing, while the left fore wing is of the usual type. The lower half of the hind wings is also nearly white. There is a larger area of white on the left hind wing than on the right. The butterfly had a peculiar appearance when flying. It is unfortunately a little broken.—ID.

NOTODONTA DICTÆOIDES NEAR BARNSLEY.—Whilst collecting in Lunn Wood, about three miles from here, on the 21st June of the present year, I was fortunate enough to box a fine specimen of *Notodonta dictæoides* off the side of the shooting-box. This is an unusual occurrence for this neighbourhood.—W. E. BRADY; 1, Queen Street, Barnsley, June, 1880.

VARIETY OF ABRAXAS ULMATA.—On June 22nd, whilst catching *Abraxas ulmata* in Bamford Wood, near Rochdale, with a friend, we came across one specimen with smoke-coloured wings, but marked much as usual; perhaps slate-colour would better express the colour of the wings. It was the only one we saw amongst hundreds of specimens. — J. W. BENTLEY; Stakehill Works, Castleton, near Manchester, July 7, 1880.

SEMASIA JANTHINANA.—In the 'Annales' of the French Entomological Society (5th ser., vol. x., p. 79), after a detailed description of the larva of this Tortrix, M. Clément Lafaury says:—"It lives in the berries of the whitethorn (*Cratægus oxyacantha*), uniting them in twos or threes by means of a gummy substance, so that it can pass from one to the other without exposing itself. It eats the pulpy part of the fruit only, without touching the skin. Its metamorphosis takes place between the stone of the fruit and the skin at the spot where the berries are united. It spins its cocoon towards the end of August, in which it changes to a pupa about the middle of May of the next year; the imago emerges about a month later—that is to say about the end of June."—EDWARD A. FITCH.

TORTRIX DUMETANA.—This insect occurs freely on Wicken Fen in July, but I believe it is not certainly known what its food-plant is there. This year at the end of June I found two green larvæ of a Tortrix in rolled up leaves of the dewberry, *Rubus cæsius*. These I kept separate, and have this day (July 20th) bred a male *Dumetana* from one of them. This therefore settles the question of its food-plant. I see Wilkinson states that Mr. T. Brown, of Cambridge, bred this species from larvæ feeding on oak; and Stainton also gives oak as its food-plant. Is there not some mistake here? — (Rev.) THOS. W. DALTRY; Madeley Vicarage, Staffordshire.

HEPTAULACUS VILLOSUS, *Gyll.*, AT BOX HILL.—On the 28th of June, after a gentle brush up one of the valleys on the south-east side of the hill, I sat myself down to examine the contents of my sweeping-net, and amongst a very heterogeneous mass of immature Hemiptera, Diptera, spiders, &c., I was surprised to find a Scarabædious insect which at first sight seemed to me to be an immature *Aphodius*, but on closer examination I found it to be a specimen of the very rare *H. villosus*, perhaps better known by the old generic name of *Aphodius villosus*, Gyll. The capture of this rarity tempted me to sweep again and again in the immediate locality, and I have several times since tried the same place, but the result has each time been unsuccessful. Mr. Champion, while beating close in the neighbourhood, at Mickleham, in the same month in 1875, had the felicity of finding one specimen in his umbrella, since which time I am not aware that it has been taken, at any rate so near London. I think previous to Mr. Champion's taking this insect, it had only been met with once before in this country. The exceeding rarity of this Coleopteron is an excuse for this note, thinking it would not be uninteresting to many of your readers to know that there are still good things to be met with in the neighbourhood of Box Hill and its surroundings.—T. R. BILLUPS; 4, Swiss Villas, Coplestone Road, Peckham, S.E.

HAGGERSTON ENTOMOLOGICAL SOCIETY.—The twenty-second anniversary of this Society was celebrated by a dinner at the "Kings' Oak" Hotel, High Beech, on the 11th of July, Mr. John Henderson, President of the Society, in the chair. Owing chiefly to the heavy rain in the morning, many members who were expected did not arrive, and the attendance was therefore not so good as upon previous occasions. During the day the following captures were effected:—Mr. C. M. Allen took a fine specimen of *Triphæna fimbria*, settled upon grass opposite the "Woodman" Inn, at Chingford, in the afternoon; the anterior wings of this specimen are of a dark olive-green colour. *Angerona prunaria* was flying in unusual numbers between eight and nine p.m. *Cidaria fulvata*, *Melanthia rubiginata*, and other common species were very abundant.—W. J. VANDENBERGH, Secretary.

REVIEWS.

The Transactions of the Entomological Society of London for the Year 1879.

IT has lately been our annual custom to give a *resumé* of the work done by the Entomological Society of London. This has been so fully and ably performed by Mr. J. W. Dunning in his address, read at the anniversary meeting, that this year it becomes necessary only to reprint his felicitous remarks. They were as follows:—

"The volume of Transactions for 1879 extends to three hundred and fifty pages, and (to say nothing of the several papers printed at length in the Proceedings) it contains twenty-five memoirs, illustrated by eleven plates and as many woodcuts. The authors are sixteen in number : Messrs. Butler and Charles Waterhouse, four papers each ; Messrs. Baly, Distant, and Westwood, two papers each ; Miss Ormerod and Messrs. F. Bates, Cameron, Moore, Fritz Müller, Oberthür, Rutherfurd, Sharp, Trimen, Buchanan White, and Wood-Mason, one paper each. Nine of the memoirs relate to Coleoptera, seven to Lepidoptera, three to Hemiptera, one each to Hymenoptera, Trichoptera, and Diptera, leaving three that do not relate to any one Order in particular. Twenty-two out of the twenty-five are on Exotic, three only on British Entomology. M. Oberthür's paper is published in French ; and communication with South Africa is now so rapid that Mr. Trimen's paper, which was read at our last meeting on the 3rd December, was published and distributed before the end of the month. For the most part the memoirs, though interspersed with valuable remarks on classification, variation, affinities, and distribution, must be considered as belonging to the branch of Descriptive Entomology. Of the papers on subjects of more general interest, I may be permitted to allude to Miss Ormerod's "Observations on the Effect of Low Temperature on Larvæ," to Prof. Wood-Mason's "Morphological Notes bearing on the Origin of Insects," to Prof. Westwood's paper "On some unusual Monstrous Insects," to Mr. Charles Waterhouse's paper "On the Affinity of the genus *Polyctenes*," and to Mr. Butler's paper "On the Natural Affinities of the Lepidoptera hitherto referred to the Genus *Acronycta*." Miss Ormerod's observations confirm the view generally held by entomologists, though it is scarcely the popular opinion, that cold has little or no destructive effect upon larvæ, or indeed upon insect-life in any form ; but I do not recall any place where the results of observation are stated with precision of detail, and our member has done well to record the effect of ascertained temperatures upon determined species. The monstrosities mentioned by Prof. Westwood are three butterflies with extra wings or portions of wings, and numerous cases of Coleoptera, Lepidoptera, and Diptera with imperfectly-developed heads, in which the imago retain some portion of the outer covering of the larva or pupa. Mr. Charles Waterhouse introduces us to a wondrous creature, *Euctenodes*, which he provisionally places in the family of *Polyctenidæ*, and considers allied to the *Hippoboscidæ*, whilst Prof. Westwood seems to doubt whether the group should not be referred to the Hemiptera-Heteroptera. But Mr. Butler's paper on *Acronycta* is the most startling, and to a lepidopterist of the ancient type its author must appear a perfect revolutionary. Only last year he excited some little astonishment by promulgating the view that the *Ægeriidæ* have nothing to do with the Sphinges, and that their affinities are with the *Pyralidina* and *Gelechiidæ*. I have not heard of any attempt to combat this view, and its opponents appear to let judgment go against them by default. Scarcely have the scales fallen from our eyes, and enabled us to see where the clear-winged moths ought to be placed, before Mr. Butler draws the Grey Dagger, and calls upon us to surrender at discretion, and make humble confession that under the name *Acronycta* we have hitherto huddled together representatives of eight genera belonging to four distinct families; that three-fourths of these so-called Noctuæ are in truth Bombyces; that of our English species *rumicis* and *auricoma* are *Arctiidæ*; *leporina* and *aceris* are *Liparidæ*; *megacephala*, *strigosa*, and the common dagger-moths *psi* and *tridens*, are *Notodontidæ*; and that only *alni* and *ligustri* are Noctuæ, the former being the type of *Jocheæra*, whilst the latter is relegated to *Mamestra*. Such is the result at which Mr. Butler has arrived, chiefly from a consideration of the larval characters, but relying also upon the wing-venation and structural characters of the moths. That a casual peep at a drawer-full of larvæ should produce such a transformation-scene says little for our lepidopterists; and if Mr. Butler's views are to prevail, it shows that wholesale disintegration of a system, based on mere superficial resemblance of the imago, in which for years we have all been content to acquiesce, may be expected to ensue when attention is paid to the earlier stages, and when, instead of merely collecting so many butterflies and moths and arranging them in a cabinet, the insects are studied *ab ovo*, and their metamorphoses and habits are thoroughly investigated.

"I may say that the interest of our monthly meetings has been fairly sustained; the record of our Proceedings shows that many valuable exhibitions have been made, and important subjects discussed or ventilated. In proof of this statement it will be sufficient to refer to the interesting conversations which have arisen from the introduction of such subjects as, for instance, the stridulating power of the *Mantidæ*, Brazilian Caddis-flies and their cases, flights of locusts and migrations of butterflies, flowers and their unbidden guests, the destruction of insects by flowers, sericiculture, the metamorphoses of the blister-beetle, the mimicry of insects by insects, the effects of temperature upon insects and insect-life, the existence of branchiæ in the imago-state of certain Trichoptera, sculptured markings on cretaceous pebbles from the Lake of Geneva supposed to be due to insect agency, sugar-cane borers, the correlation of mutilation in the larva with deformity in the imago, and variations in larvæ of *Smerinthus ocellatus* fed on different species of *Salix*. It has afforded me additional pleasure to observe how many of the subjects have been introduced or elucidated by the remarks of some of our junior members. This is as it should be. The younger the better and more welcome. The least experienced, if he will make use of the powers of observation with which Nature has endowed him, is sure to see something which is new to the oldest among us. There is a fair field and no favour. Those who have learnt the most are the most ready to learn, and glad to extend the right hand of encouragement to every fresh worker in the field." E. A. F.

Studies in the Theory of Descent. By Dr. Aug. Weisman. Translated and edited by Raphael Meldola, F.C.S., with a prefatory notice by Charles Darwin, F.R.S. Part I., "On the Seasonal Dimorphism of Butterflies."

This work is a welcome addition to the literature of Darwinism, and the thanks of all entomologists are due to Mr. Meldola for the excellent translation he has placed before English readers.

It is well known to British entomologists that the form of *Pieris napi*, which appears in the perfect state in the spring, differs very materially from the imagines of the same species which appear in the autumn; the difference is so striking that the late Mr. J. F. Stephens described them as distinct species, and never quite gave up the belief that they were so.

Dr. Weisman, reflecting on this seasonal dimorphism, conceived the hypothesis that, during the glacial epoch, but one form of the insect existed,—probably the spring, or, as, he terms it, "winter form,"—and that, as the seasons became ameliorated, the broods produced from this form had time to pass through all their changes from the egg to the imago in a few weeks, and the summer form of the insect was the ultimate result. These latter laying eggs, which became chrysalids in the autumn, and remained in that state until the next spring, when the perfect insect emerged, thus completing the seasonal dimorphism.

Dr. Weisman's carefully-conducted experiments have placed this hypothesis beyond doubt. By the application of cold to the chrysalids of the summer form he retarded their development, and produced from them the winter form, precisely as is always the case in *Pieris napi*, variety *Bryoniæ*, which inhabits the high alps, is single-brooded, and appears in one form only, and this much darker than our own winter form. It would thus appear probable, assuming *P. bryoniæ* as representing the original coloration, that the ordinary winter form has lost something of its colour in acquiring the dimorphic condition.

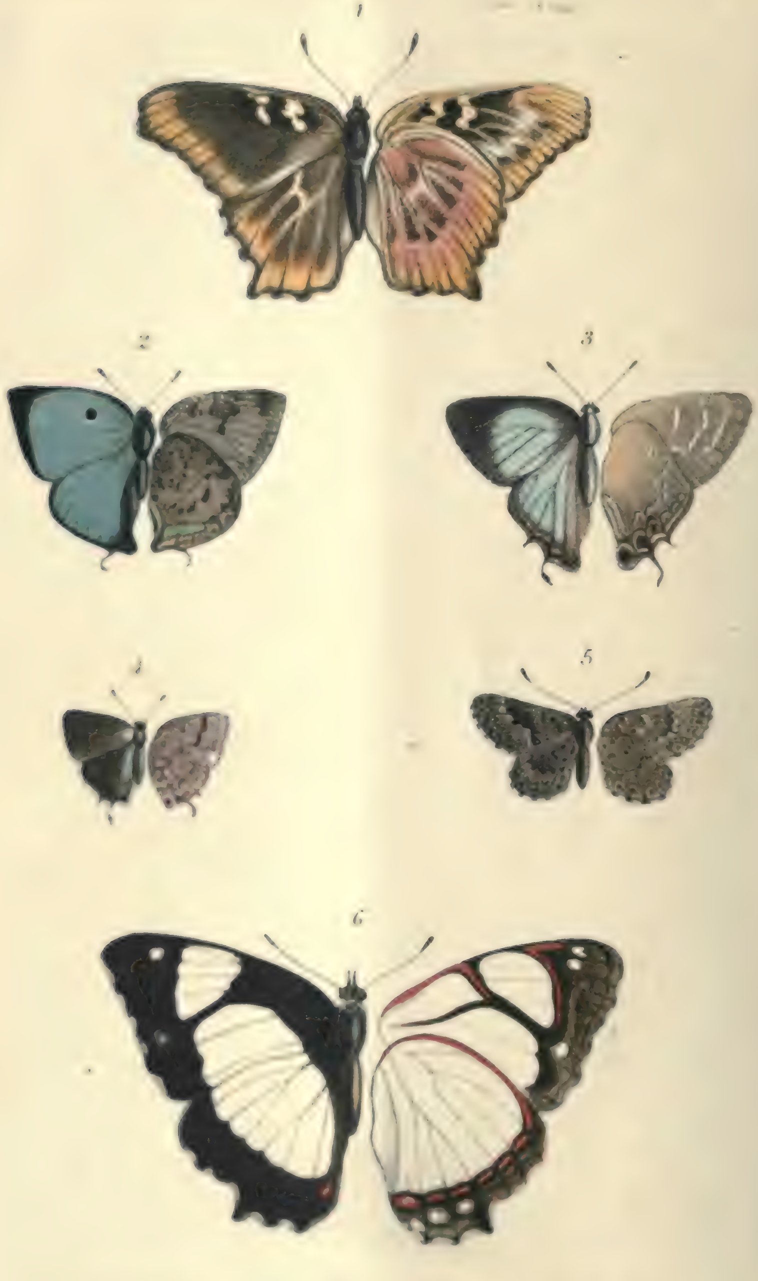
Of our British butterflies, Dr. Weisman draws attention to seasonal dimorphism in *Pieris brassicæ, P. rapæ, Plebeius Agestis* (*Alexis*, Scop.), *Polyommatus Phlæas*, and *Parargia Ægeria*, but in some of these cases the differentiation is complicated by the effects of local climate. Still these species are well worthy of investigation, although the variation between the summer and winter forms may be very slight.

It is, however, in a species not found with us that Dr. Weisman has made the greater number of experiments, and arrived at some most interesting and instructive results. *Araschnia Levana* is the winter and probably original form of the species which has been differentiated into *Araschnia Prorsa* as the summer form, and often intermediate specimens are produced which are known as *A. Porima*. For the details of these experiments the work should be referred to; they appear to have been carefully made and faithfully recorded.

We look forward with pleasure to the completion of the work by the publication of the second and third parts.—J. J. W.

OBITUARY.

THEODOR HARTIG.—The 'Entomologische Nachrichten' for July 1st contains an obituary notice of this worthy Brunswick entomologist. From it we learn that Theodor, son of chief ranger Georg Ludwig Hartig, was born at Dillenburg on the 21st of February, 1805. In 1833 he was appointed professor of forestry in the University of Berlin, but removed to the Collegium Carolinum of Brunswick in 1838, where he worked hard and to his own great honour for forty years. He died, after two days' illness, on Good Friday last (26th March), in the seventy-sixth year of his age. Hartig's name has frequently occurred in the pages of this journal both in connection with the translation of Vollenhoven's life-histories of sawflies, and as sponsor to the greater number of *Cynipidæ* in the translation of Mayr's work on the European oak-galls. His chief works, all remarkable for their scientific method and accuracy, are 'Die Familien der Blattwespen und Holzwespen' (Berlin, 1837), and 'Einleitung zur Naturgeschichte der Hymenopteren' (Berlin, 1860); his three papers on "Die Naturgeschichte der Gallwespen," in Germar's 'Zeitschrift fur die Entomologie' (vol. ii., pp. 176—209; iii., 322—358; iv., 395—422: Leipzig, 1840—3), and his attempt at the classification of the *Aphididæ* (plant-lice) according to their wing-characters, which also appeared in the same publication (vol. iii., pp. 359—376, 1841). The earlier volumes of the Stettin 'Zeitung,' and many other entomological and botanical serials, also contain important memoirs from Hartig's pen; the Royal Society's Catalogue indexes seventy, published between 1835 and 1871.—E. A. F.



1. Amartia Corona.
2. Thecla Cimelium
3. Thecla Irala.
4. Thecla Cruenta.
5. Charis Zabua.
6. Pyrrhogyra Arge.

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THE BUTTERFLIES OF PARAGUAY, AND LA PLATA.

By P. H. Gosse, F.R.S.

(WITH A COLOURED PLATE).

For some time past I have been receiving from extra-tropical regions of South America, collections of Butterflies made by my friends, the MM. Richard, William, and Thomas Perrens, young Englishmen settled on Estancias on the W. bank of the River Corrientes, in the Province of the same name, in the Argentine Republic. One or other of them occasionally makes long journeys into the neighbouring State of Paraguay, and always uses his opportunities as a diligent entomologist. Latterly they have favoured me with brief notes of habits, seasons, localities, &c. The results I embody in the following List of species, which is, indeed, a double list, since I distinguish, in every case, the patrial habitat. This may be described as—1. South of the great westerly bend of the River Paraná, to 30° S. lat. = Corrientes; 2. North of that bend, to 24° S. = Paraguay.

I venture to hope that these Lists and Notes of Butterflies (*Hesperidis omissis*) may possess some interest for English Entomologists.

Papilionidæ.

Papilio Polydamas, Linn. Near Asuncion. Dec. to March. At edges of woods: not uncommon. I receive *Polydamas* from Jamaica, from Pernambuco in Brazil, from Paraguay, and from Corrientes. There are peculiarities in the last-named, which I do not see in the others. On the upper surface of the hind wings the yellow band has much more the character of an even-edged broad ribbon, than a series of arched spots. On the under surface of the same, the marginal red spots are changeable; being rosy-pink, when the angle formed by the incident and the reflected rays is very acute; orange-scarlet, when this angle is obtuse. Lucas's figure (Lep. Exot. pl. 17) appears to have been taken from this southern form; but he does not notice the changeable hue.

P. Microdamas, Burm. Paraguay, near Asuncion. Edge of a wood: very rare.

P. Perrhebus, Boisd. Corrientes: many examples sent; all caught around trees in the evening. An insect of remarkably slow flight. Paraguay; all parts. Hovering over water in woods. Nov. to Feb.; scarce.

P. Agavus, Dru. Paraguay, near Asuncion. In woods; not scarce. Nov. and Dec.

P. Anchises, Linn. Corrientes: about or near trees; flies, in general, very high; but frequently settles on flowers in the shade. Paraguay; about puddles; rather scarce. Jan. to March.

P. Polycaon, Cr. From Corrientes, and from Paraguay: very rare in both localities. In the latter, taken at the edge of a wood, in Dec.

P. Torquatinus, Esp. Paraguay: Dec. to Mar. About pools; very rare.

P. Lycophron, Hübn. Corrientes. Two or three examples in poor condition sent thence, with no notes. None from Paraguay.

P. Thoas, Linn. In all the collections from Corrientes, where it is evidently an abundant species. The examples are of the full dimensions proper to this noble species. None have yet been collected in Paraguay, though it is known to range from the U. States, through the Antilles, through Guiana, and through Brazil. Dr. Burmeister (Desc. Phys. Arg. Rep.—Lepidopt. p. 59) divides the species into six sub-species, to all of which he gives names. All the Argentine examples he assigns to the one which he diagnoses under the name of *Thoantiades*. But my examples do not bear out his distinctions, as being constant.

Euryades Corethrus, Boisd. Corrientes. Both sexes have been received in some abundance. Always observed in the open; descending to hover over grass or flowers. Dec. to April.

E. Duponchelii, Luc. Corrientes: numerous examples of both sexes. Habits, localities, and seasons the same as those of the preceding. Both are of lofty flight: they rest during the night on trees. Both the species of this interesting genus appear to be strictly limited to the higher latitudes; not a single example of either having been sent me from Paraguay. Burmeister (*op. cit.*, Atl. pl. 3) has well figured both sexes, and the reverse sides, of both species; and, on an enlarged scale, the curious genital organs. He describes the larva of the latter as feeding on *Aristolochia fimbriata:* the larva of *Corethrus* is still unknown.

PIERIDÆ.

Leptalis Perrensii, mihi. A single example received from Corrientes, with no note. It must have been taken in Sept., and not met with since; nor has it occurred in Paraguay. The specimen agrees very accurately with the figure, No. 3, of Swainson's *Licinia Amphione* (Zool. Illustr. ii. pl. 91); which he considers the female. But it differs so importantly from *Pap. Amphione* of Cramer (iii. pl. 232, E, F), that the two cannot be considered the same species. *L. Perrensii* lacks all trace of the orange mark which precedes the yellow band at the tip of the discoidal cell in the fore wings; and the costal bar of orange, broad and reaching the yellow band in *A.*, is short and very narrow in *P.* In the hind wings there is but a single longitudinal band, which is interiorly lemon-yellow, exteriorly rich orange; and there is not a trace of the great palmate yellow band of *A.* Beneath, the colours are arranged as above, but are paler; the black becoming a pale fuscous, especially on the hind wings, in which it greatly suffuses the yellow and orange. Under these circumstances, considering the two forms distinct, and seeing that the earlier name must be retained for Cramer's species, which seems to be the northern form, I assign to Swainson's, the name of my contributors in Corrientes. Dr. Burmeister makes no mention of it in "Lep. de la Rep. Arg."

L. Thermesia, Godt. Paraguay. Nov. to Feb. Banks of brooks: scarce.

Pieris Monuste, Linn. This wide-spread White I receive from Corrientes and from Asuncion: taken from Sept. to March, flitting at edges of woods, but reported "very scarce."

P. Automate, Burm. From Corrientes only: scarce. Settles on wet spots, in paths through woods.

P. Menacte, Boisd. Paraguay. Common near woods.

P. Autodice, Hübn. Corrientes only: common; always in the open. March and April.

Terias Deva, Doubl., and *T. Elathea*, Cr. Both plentiful, in all parts of the open, from Corrientes to Asuncion.

T. Albula, Cr. Not sent from Corrientes, but abundant throughout Paraguay, in open places.

Colias Lesbia, Fabr. Abundant near Goya in Corrientes, where it apparently reaches its northern limit. The male, when very fresh and unrubbed, has a changeable flush of amethystine hue, from the deep orange upper surface, when the incidence of the light is very acute. This is charming, but I am not aware that it has been noticed before.

Callidryas Sennæ, Linn., and its var. (?) *C. Marcellina*, Cr. Both forms abundant; the latter limited to Paraguay.

C. Philea, Linn., and *C. Statira*, Cr. Both of these abundant from Goya to Asuncion.

C. Cipris, Fabr. This also is common throughout. From Paraguay, three very distinct varieties are sent; having the ground colour of each surface respectively, deep fulvous, citron-yellow, and cream-white. The varieties are all small, not exceeding in dimensions Mr. Butler's fig. of *C. Irrigata* (Lep. Exot. xxvi. 2); their marks, on both surfaces, are slight, and even evanescent. The creamy var. has some suffusions of very light green, here and there, below, scarcely observable. I cannot consider these forms to have specific rank. It seems to be, certainly, the *Phœbis Bracteolata* of Mr. Butler.

Gonioptcryx Clorinde, Godt. Near Asuncion, and northward. Rather scarce: Oct. to Feb. Habits those of the *Callidryades*; hovering over pools and lakelets, in the open. A noble species, and well-developed; my examples reaching an expanse of 4 to 4½ inches.

DANAIDÆ.

Danais Archippus, Fabr. Common throughout at all times. In open places, generally near woods.

D. Erippus, Fabr. Not from Corrientes, but common throughout Paraguay, with the same habits.

HELICONIADÆ.

Thyridia Themisto, Hübn. Paraguay, from the north bank of the Paraná to Asuncion Plentiful in some situations, in the woods. Oct. to Jan. A very striking butterfly.

Ithomia hyalina, Fabr. A very elegant little species, with difficulty distinguished from the familiar West-Indian *Ith. diaphana*. It occurred, sparsely, in the woods near Asuncion, from Nov. to Jan.

Tithorea Harmonia, Cr., var. *Megara*, Godt. Of this, which finds no place in Dr. Burmeister's enumeration (*op. cit.*), a single specimen, in battered condition, was sent me from Corrientes, having been taken in Sept. In markings it agrees well with the variety figured in Doub. and Hew., pl. xiv. fig. 2: but the ground-colour is the dull sienna-brown of Cramer's figure, not the fine scarlet which Mr. Hewitson gives to it.

Mechanitis Elisa, Guer. Taken plentifully in woods, in the neighbourhood of Asuncion; from Nov. to March.

M. Ethra, Godt. This elegant species, which might readily be taken for a true *Heliconia*, is still more abundant than the preceding, in the woods of the whole of Paraguay, from the Paraná northward, from Sept. to Jan.

Heliconia Phillis, Fabr. A beautiful, and a wide-spread butterfly, reaching even occasionally to Buenos Ayres, according to Dr. Burmeister. I have not yet received it from Corrientes; but from Paraguay it is sent abundantly, where my friend finds it, from Sept. to March, in the whole region, chiefly in woods.

Acræa Thalia, Linn.; *A. Pellenea*, Hübn.; *A. Anteas*, D. & H.; *A. Mamita*, Burm. All these forms come to me from Corrientes and from Paraguay: the largest, and the most pronounced in colours, from the more northern region. They are reported to occur at the edges of the woods, in the spring and early summer months. But, after examination of a multitude of examples, I cannot resist the conclusion, that they are all varieties of one species, between which no fixed diagnostic lines can be drawn.

NYMPHALIDÆ.

Colænis Phætusa, Linn. One example has been sent from Corrientes; many from Paraguay, where it is described as plentiful, from Nov. to Feb., particularly as the Tropic is approached. It affects open places.

C. Julia, Fabr. Locality and season as the preceding, but rather less abundant. It frequents the margins of woods rather more than its fellow.

Agraulis Vanillæ, Linn. The extreme commonness of this species, in the So. Un. States, in the West Indies, and throughout the vast plains of South America, at least as far as La Plata, tends to render us insensible to its splendid metallic refulgence. Its localities and seasons are those of the preceding two: it is abundant everywhere in the open, from Corrientes to Asuncion.

Euptoieta Claudia, Cr. A single example obtained near Goya, at the end of March, on flowers in an open sandy spot.

Phyciodes Liriope, Cr. Abundant in all parts of the open, both of Corrientes and Paraguay: Sept. to Dec. In this var. the fulvous hue greatly predominates, the black pattern being reduced to a minimum above, and almost obliterated below. But two examples of a variety are sent, from near Asuncion, which is larger, and in which the black so predominates as to give quite a different facies, covering the basal half of the four wings, and leaving only fulvous spots. Cramer's figure (pl. i. C, D) is an intermediate condition. It is said to be taken at the edges of woods: scarce.

Ph. Hera, Cr. A species is sent from Paraguay and still more numerously from Corrientes, which agrees (though not exactly) so well with Cramer's pl. 253, F, G, that I conclude it to be the same, though it is not included by Dr. Burmeister. Sept. to March. Edges of woods, very plentiful in all parts.

Ageronia Feronia, Linn. In woods, near Asuncion, in Nov. Very scarce.

Pyrameis Huntera, Fabr. This most beautiful Painted Lady is spread from New York, through the continent, to Patagonia: for *P. Myrinna* of Doubleday is surely but a strongly marked variety. It is sent me in abundance by my friends from Corrientes, but becomes much scarcer as they go northward.

Py. Carye, Hubn. This seems a peculiarly southern form. I receive it numerously from Corrientes, but not one example from Paraguay. Dr. Burmeister gives Patagonia to Rio Negro as its habitat; and says it is abundant at Buenos Ayres, even in the streets of the city.

Eurema[*] *Zabulina*, Godt. Taken in Dec., at the edge of a wood, near Asuncion: very rare.

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[*] The genus *Eurema* (Doubl.). = *Hypanartia* (Hübn.) appears to me useless, because inseparable from *Pyrameis*. The species have the same facies, and the same neuration. *Hippomene* cannot, without violence, be severed from *Lethe* on the one side, nor from *Atalanta* on the other.

Junonia Lavinia, Cr. This, and its marked var. *Geneveva*, Cr., both come abundantly from both Paraguay and Corrientes. They affect open places, from Nov. to Mar.

Anartia Jatrophæ, Linn. Seasons, localities, habits, and abundance, as the preceding. A wide-spread species.

A. Amalthea, Linn. The form in which this species* occurs is abundant from Goya to Asuncion, generally on the banks of brooks. Oct. to Feb.

A. Corona, mihi. The 1st and 2nd subcostal nervules both present; springing very close together, both anastomosing with the costal, and both presently arching from it, and lost in the costa: disco-cellulars exactly as in *Jatrophæ*. Above, all the w. brownish black, paler at base, and along inner margin. A broad band of orange, ill-defined, divided by the blackish nervules, runs parallel to, and just within, the margin: two angled bands of white cross the disc.-cell in the fore, and one in the hind w. In the latter the nervules are bordered with pearly white. Beneath, the pattern is as above; but more distinct; the white nerve-borders spread so as to make much of the area white; the orange of the sub.-marg. band is paler; but in the h. w. becomes scarlet at its inner side. Squamation somewhat sparse. Exp. 2·2 inches. The outline of the wings is exactly that of *Jatrophæ;* and, unlike as it appears, the pattern of that species may be traced, especially in the angled bands within the cell of f. w. My friends' *estancia* bears the name of *Corona*, which name I adopt for this rather curious *Anartia*. One example in my cabinet, which was taken near Asuncion, in the open, in Feb. (See fig. 1).

Temenis Laothoe, Cr. Sent, with no note, from Paraguay.

Eunica Maja, Fabr. Taken in all parts of Paraguay, from Oct. to Jan.; in woods, rather scarce.

E. Margarita, Godt. Paraguay. On the banks of a brook near Asuncion; scarce. Nov. to Jan. Corrientes. A single example, taken in April, in a path through the *monte*.

Pyrrhogyra Arge, mihi. This may possibly be only a local var. of *P. Tipha*, L., but its facies is so different as to make it quite as worthy of specific designation as many that are so honoured now-a-days. The outline of the wings is quite different;—much broader behind, the hind pair much squarer. The beautiful pearly white area of the upper surface (whence I have chosen its sp. name) occupies fully half of the whole, and has between it and the margin (in the f. w.) two white spots, of which the anterior is the more conspicuous and well-defined; in some specimens, however, there is only a dim trace of this spot, and none of the second. Beneath, there is little difference that is describable. Exp. 2 to 2·5 inches. It seems in some respects intermediate between *Tipha* and *Neærea*, L. Paraguay; at edges of woods; rather plentiful. Sept. to Mar. (See fig. 6).

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* I do not think this can pretend to claim a *specific* status; but it is a fine and very striking var.; and one which shows no tendency to change in a large number of examples, from all parts. Expanse to above 2·5 inches. Of the six white spots that run across the middle of the front wing (Cram. ccix. A, B.; Doub. & Hew. xxiv. 5), the anterior five are changed into a broad transverse band of white, crossed by the sub-costal and discoidal nervules, as fine black lines. No example with the ordinary facies has occurred.

Eubagis Artemisia, Fabr. Moderately common near Asuncion, about puddles. Dec. to Mar.

Catagramma Sorana, Godt. From Asuncion northward: about puddles. Scarce. This appears to be *C. Zerynthia* of Burmeister (Rep. Arg. Lepid., 173, 511, Atl. v. fig. 9), but not the *C. Latona* of Butler (Lep. Exot. 181, pl. 63, fig. 3). All are grand species!

C. Pyracmon, Godt. Throughout Paraguay. Oct. to March. Plentiful in some parts: frequenting puddles in the open. *C. Hydaspes*, Dru., has not yet been sent me; but it is said to reach to Corrientes.

Hæmatera Thysbe, D. & H. Near Asuncion in Dec. About puddles: scarce.

Didonis Biblis, Fabr. A few examples taken in April, in a forest-path on the bank of the River Corrientes. In Paraguay it is found throughout; from Sept. to March; always in or near woods, in no great plenty.

Megalura Peleus, Sulz. Near Asuncion, in the open, in Dec.; very rare.

M. Chiron, Fabr. Near Asuncion, and farther north. Affects the vicinity of water: not common.

Heterochroa Iphicla, Linn. Near Asuncion; moderately common, at the edges of woods: Nov. to Feb.

Apatura Agathina, Cr. Sent from Corrientes, and, somewhat more numerously, from Paraguay. In both regions, it is accredited with a proclivity for stagnant puddles and wet mud, like its imperial relative here in England.

A. Varuna, Godt. Paraguay. I have received two examples, both females, taken near Asuncion, in Dec. and Jan., at edges of woods. Very scarce.

Paphia Stheno, Prittw. Woods near Asuncion ; Dec. and Jan. : very rare.

P. Glycerium, D. & H. Corrientes, in April. Caught as it played over a water-hole in a path through a wood. Remarkable for a very rapid, and zigzag manner of flight. Near Asuncion it was scarce, in Dec. and Jan., at the edges of woods.

Libythea Carinenta, Cr. Near Asuncion ; Nov. to March : quite plentiful at the edges of woods. Later it has occurred also in Corrientes, in the like localities ; where my correspondent has specially remarked its rapid, darting flight, and its habit of always choosing a *dead* twig for its resting-place.

MORPHIDÆ.

Morpho Achilles, Linn. Paraguay ; from the banks of the Paraná, as far as Asuncion, at least ; shady walks in woods : abundant ; always of the var. *Achilles* proper.

BRASSOLIDÆ.

Brassolis Sophoræ, Linn. Near Asuncion. One or two examples only, taken in the open, in March.

Dynastor Darius, Fabr. Two examples were sent from Corrientes in March. They are described as appearing only on the approach of evening. Both were females, and, with each, I found, in the inclosing paper, several new-born larvæ ; about 0·5″ in length, with large globose head, and cylindric body terminating in two divergent processes, each carrying a strong seta. This form is proper to the known larvæ of the family : and, combined with fragments of pearly egg-shells, also in the papers, they show that the butterflies, incompletely killed, laid their eggs in the paper pockets ; that these hatched on the voyage, and were starved to death, of course. A tragic history !

SATYRIDÆ.

Taygetis Andromeda, Cr. Scattered sparsely throughout Paraguay. Woods ; Sept. to March. Var. *b.* of Mr. Butler's Catalogue.

T. Chelys, Fabr. Taken in Nov. in a wood near Asuncion.

Euptychia Summandosa, mihi. Paraguay throughout; Oct. to Jan. Woods; scarce. Above, pellucid-white, fuscous-edged; not to be distinguished from *Cissia* of Cr. (cxciv. D), if we allow for the inferior surface seen through the scant squamation. Below, fuscous, crossed by one white band beyond the cell, from costa of f. w., at one-fourth from point, to anal angle of h. w., narrow at each extremity, but enlarging (abruptly in the f. w., gradually in the h. w.) to the point of overlapping. Ocelli almost obsolete in f. w.; obsolescent in h. w., where 1st, 2nd, and 5th are black-pupilled, 3rd and 4th unpupilled, all in fulvous rings. We have here another imitation, almost exact, of the under surface of the Asiatic *Hesione* group, such as *Mycalesis mandosa*, as figured by Mr. Butler (Cat. D. L.; Sat.; iii. 9).

E. Celmis, Godt. Corrientes; always in high grass. Paraguay. Woods near Asuncion, in Dec.; scarce. The examples agree with Burmeister's "var. pag. sup. *a*; p. inf. *b*." (*Op. cit.* 211).

E. Sosybius, Fabr. Paraguay. Sept. to March. Abundant near woods, in all parts.

E. Periphas, Godt.? Paraguay; but not distinguished from the preceding.

ERYCINADÆ.

Notheme Eumeus, Fabr. Paraguay. Near puddles; very rare; March.

Lymnas Melander, Cr. Paraguay. Edges of woods: scarce; Nov. to Feb.

Riodina Lysippus, Linn. Corrientes; many examples, but no notes. Paraguay. Abundant in all parts; Oct. to Feb.; edges of woods.

Emesis Ocypore, Hübn. Corrientes; about bushes at the edge of the *monte*, or scrub-clad hills. I do not receive this from Paraguay; Hübner ascribes it to Mexico.

Charis Zabua, mihi. Corrientes; March; not uncommon, in open places, destitute of grass, but having scattered low flowering plants. This tiny moth-like butterfly may be thus described. Above, all the wings dull greyish-brown. F. w., basal half crossed by three black bands interrupted by the nervures, of which the third is joined by a very undulate band, inclosing a dark brown patch, at the end of the disc.-cell, and a white spot on the costa. Margin with two rows of black arches, whose points descend into the deep fringe. H. w. similar in colour and marking, but suffused with a warmer brown, especially on the outer half. Beneath, ground-colour lighter; the bands resolved into defined black spots; each (and markedly each black-marginal arch) bounding and inclosing a spot of white. This mode of white speckling characterizes, in some individuals, the upp. surf. also. Expanse 0·8 to 1·15 inch. Name from Heb. *zabua*, "speckled." (Jer. xii. 9). It seems near *Arius*, Cr. pl. xxxi. E. (See fig. 5).

Lasaia Meris, Cr. Paraguay. Dec. to Feb. About puddles; scarce.

Lemonias Campestris, Bates (or very closely allied to this). Paraguay. In the open, near Asuncion. Nov. to Jan.; scarce.

Anatole Glaphyra, Westw. Paraguay: on the banks of a brook near Asuncion, in Nov.: very rare.

Nymphidium Arche, Hew. (or very closely allied to this). Paraguay; near puddles, in January; not common. A single example from Corrientes.

LYCÆNADÆ.

Thecla Polybe, Linn. Paraguay: Dec. Margins of woods near Asuncion; scarce.

T. Cimelium, mihi. H. w. two-tailed; anal angle produced into a minute point, but with no rounded lobe. F. w. with the shoulder strongly rounded. Above, we see the very counterpart of *T. Polibetes*, Cr. (pl. 341), or, yet more exactly, of *T. Syncellus*. Cr. (pl. 334), save that the black spot in the cell is small, round, and surrounded by a pale ring: the intense blue hue has the same refulgent lustre. Below, it is very different from either: ground warm fuscous; f. w. with three transverse bands of blackish, of which the second dilates in its middle into a broad oval patch: the third is short, and nearly apical. In the h. w. the same bands are recognised, but extending all across, and much more scattered and broken by the copious aspersion of fuscous scales: an undefined angled patch of dull green at the anal angle. What I suppose to be the female has the blue less lustrous, and the black margin much broader, so as, in the f. w. to include, and so destroy, the spot with its ring. Exp. 1·2 inch. Examples male and female are in my cabinet. The name alludes to the gem-like beauty of the male. Paraguay; in woods; Dec. to Feb.: scarce. (See fig. 2).

T. Dolylas, Cr. Corrientes. Several examples taken in a garden, in March. "A butterfly of rapid flight."

T. Meton, Cr. Paraguay: woods near Asuncion, in Dec.: very rare.

T. Linus, Sulz. Paraguay: woods near Asuncion. Dec. and Jan.: scarce.

T. Simaethis, Dru. Corrientes. In an open sandy spot, with scattered flowers, but no grass. A few examples taken in March and April.

T. Cruenta, mihi. Above, f. w. sooty black, with a very slight reflex of greyish blue toward the base. H. w. sooty black on the outer half, with a few minute scattered azure scales; gradually becoming bright azure on the half occupied by the median nervure and its nervules: abdom. fossa nearly white. Below, all w. light brownish grey, crossed by four bands of dark red; viz. on f. w. a dash across the cell; then one widening in the middle, where it is broken, and (so to say) disjointed, beyond the cell; then a loose and vanishing cloud of red specks; and then a line on the very edge. H. w. much the same, but the first band consists of three, and the second of many, disjointed portions. There is a red spot between the bases of the two tails, and a black-centred red spot on the anal lobe. The thorax is black, and the abdomen white above, both sprinkled with azure scales: these parts are white beneath. Exp. 0·7 inch. This pretty little species my London correspondent marks as *Tmolus Celmus* of Cr., near which it evidently comes; but it is, I think, distinct. It is also near *Th. sanguinalis* of Burmeister (*op. cit.* p. 239), which he describes as *ecaudate:* but mine has the tails of the usual length. Corrientes, on bushes and flowering herbs at the edge of the *monte.* One specimen in April. (See fig. 4).

T. Celmus, Cr. This differs from the preceding. Above, all the w. lustrous deep blue, with a broad outer margin of black, well defined. Below, light grey: f. w. crossed, at half- and three-fourths-length, by two faint darker lines. H. w. with two or three indistinct dusky spots; a red spot between the tails, and one on anal lobe, both black-centred. Exp. 0·7 inch. Paraguay; Dec.; edge of woods; very scarce.

T. Eurytulus, Hubn. Corrientes: plentiful. Paraguay: rather scarce: Dec. and Jan.

T. Beon, Cr. Corrientes: bushes and flowers at the edges of he *monte*, in April. Very scarce.

T. Ivelia, mihi. Anal lobe of the h. w. present, but small: shoulder of f. w. not projected. Area of all wings a rather light and not very lustrous blue, broadly margined with black, except at the overlapping. H. w. somewhat produced behind; and at this part the black margin is interrupted by two white submarginal lines. Below, all w. light warm fuscous, crossed by a white line at the end of the cell, and three white macular bands, black-edged inwards, parallel to the margin; the outmost band obsolescent. The h. w. has, besides, a white marginal line, and another white line running along the fringe, at the hinder edge, where also is a black-pupilled and black-browed scarlet eye; anal lobe black, slightly red-edged. Exp. 1·65 inch. Name underived. My only example is, I suspect, a female, and the diagnosis must be considered provisional. Paraguay, edge of a wood on the north bank of the Paraná, in Oct.; scarce. (See fig. 3).

T. Crolus, Cr. Paraguay; taken with the preceding: scarce.

T. Mulucha, Hew. Corrientes: April. On bushes and flowers at edge of *monte*. Paraguay (with no note).

I have a suspicion, which, for want of a larger series of examples, I can neither prove nor disprove,—that *Mulucha*, *Crolus*, and *Celmus*, are but one species.

T. Marsyas, Linn. Corrientes; not uncommon; taken almost exclusively in the forest, amongst the *pinas*, a *Bromelia*, "with horrible horny hooked thorns set in vertical rows, like those of the pine-apple, but much larger and stronger." Paraguay; at margins of woods. Nov. to Jan.

Lycæna Cassius, Cr. Corrientes: common.

L. Hanno, Stoll. Paraguay, near Asuncion. In open camp; plentiful. Sept. to March.

One or two more *Lycænæ* are sent from Paraguay, which I have not identified, but which I will not venture to describe.

EXPLANATION OF PLATE.

Fig. 1. Anartia Corona.
„ 2. Thecla Cimelium.
„ 3. Thecla Ivelia.
Fig. 4. Thecla Cruenta.
„ 5. Charis Zabua.
„ 6. Pyrrhogyra Arge.

NOTES FROM THE NEW FOREST.

By J. Jenner Weir, F.L.S., F.Z.S.

I visited the New Forest on 23rd July, and remained at Brockenhurst until 9th August. Except during the first three days the weather was very wet, and many parts became swamps.

Argynnis Paphia.—This species was, as usual, abundant, but much earlier in its appearance than last year; the first seen in 1879 was on 19th July, but on 23rd of that month this year most of the males were already worn. The variety *Valezina* was out in fair proportion; one was seen perfectly hermaphrodite, the wings on one side being of the normal colour of the male. Charles Gulliver took a very singular hermaphrodite; the two left wings were male, and the right female; but the upper edge of the primary wing on the latter side was of the usual tawny colour, and one-third of the secondary wing was so coloured; so that in one insect both gynandromorphism and dimorphism existed. I do not remember ever to have met with so remarkable a case. I took a female with a greenish spot on each of the lower wings, and one male with a well-defined white spot on each wing, the spots on the lower wings being somewhat greenish. I observed several females depositing their eggs at some distance from the ground under the lichens growing on the trunks of the oaks, and proved the fact by finding the egg; the young must in these cases often have to travel down the stem ten feet or more before they could reach their food, the leaves of *Viola canina.* The appearance yearly of this insect with white spots on the wings is worthy of remark. Last year I was equally fortunate in taking specimens so coloured.

Vanessa Io.—Of this species I saw several with a minute blue spot on the secondary wings between the ocellus and the inner edge of the wing.

Apatura Iris.—This insect has been less rare than usual; a female was taken by myself from a beech tree; Charles Gulliver took six, and I heard of and saw others. One taken by Gulliver had settled on his cottage, and at Lady Cross a fine male was taken from the door-step.

Lithosia quadra.—Last year this insect was confined mostly to one wood, but this year it appeared to be distributed all over the forest in suitable localities; the females were very much commoner than the males, I should think in the proportion of ten to one. *Liparis monacha* was commoner than usual, the males far less numerous than the females; some unusually dark varieties were taken. *Cleora glabraria* was very common in the larval state; I heard of collectors taking them by the gross. I found a few dozen, but all were destroyed by Ichneumons; they were late larvæ, and I do not doubt that the presence of the parasite retarded their development, thus giving the Ichneumons a better chance, when they assume the perfect state, of finding caterpillars large enough for them to deposit their eggs in.

At sugar almost no insects were seen on some evenings, and the only species taken by myself worth mentioning was one specimen of *Cymataphora oo*.

Mrs. Greathed, of Lady Cross, very kindly presented me with a female of *Odonestis potatoria* of the red colour of the male, with very little of the yellow which usually characterises her sex. I have but once heard of a similar aberration.

I should say that upon the whole it is the worst year for entomologists ever known in the New Forest, many common species being quite absent.

At page 186 of last month's 'Entomologist,' Mr. P. J. Lowry states that he took *Cleora viduaria*. Is he quite sure it was that species? It has not been heard of in the locality for many years. On the same page he states also that he took *Liparis chrysorrhœa*. Is he sure that the insect was not *L. auriflua?*

Pieris napi.—This insect appears in the New Forest to deposit its eggs in *Barbarea præcox*, in very wet places, where the larvæ must be constantly liable to submergence, as must also often be the case when they feed on *Nasturtium officinale*, a favourite food of the species; it appears to have a very different constitution to that of its allies, *P. brassicæ* and *P. rapæ*, which always feed in dry places. All observations on this insect are now invested with great interest, in consequence of Dr. Weisman's experiments. I am engaged in rearing it from the egg.

6, Haddo Villas, Blackheath, London, S.E., Aug. 16, 1880.

CALANDRA ORYZÆ AND ITS ASSOCIATES.

By T. R. Billups.

In a former article upon *Calandra oryzæ* and its associates (Entom. xii. 267) I promised that, at a future date, the contents of a second parcel of corn-refuse received from my friend Mr. Fitch should form the subject of a further note; I now propose as briefly as possible to state the results of a very minute and close examination of the boxes. I was, however, glad to get the parcel into my garden before attempting to open it, as the outside of it was covered with life which had escaped in transit. A more lively consignment the carrier had never had to carry, and all my endeavours to explain to him that our little friends were nothing more than small beetles made no impression; he was quite sure they were too lively to be beetles, so they must be fleas. Our carrier's fleas, however, proved to be *Hypophlœus depressus*, F., an insect Mr. Fitch seems to have met with, but not in any particular abundance previously to this: these insects had made their escape from a box which contained, by weight, exactly six ounces of clean insects without any refuse whatever. This box I exhibited at one of the meetings of the South London Entomological Society, and it contained probably the largest number of living insects ever exhibited before or since at one time; to attempt to count the whole of this living mass would sorely tax my powers of patience and endurance, so I was compelled to take the more systematic way of weighing, and then counting some eight or nine samples, to form a rough estimate of the enormous quantity in our little box. I found that 800 weighed upon an average exactly one grain avoirdupois, so that we had in our box, in round numbers, 2,100,000; this is entirely irrespective of some thousands that had made their escape on transit from Maldon to Peckham. Mr. Fitch told me that on sweeping up this collection for me, the sides of the sacks standing in the granary were literally covered, so that you could scarcely tell the original colour of the sacks. On opening this box there was a strong peculiar acid smell, resembling the fumes given off from the nest of *Formica rufa* when disturbed. But the result of the examination of the contents of the second box was much more interesting, as it contained several Coleoptera unnoticed by Mr. Fitch, while one is new to our fauna, and another will probably have to be restored to its original place in the British list from which it was expunged by Dr. Sharp. In addition to my list, which numbered eleven species, I have now to add nine, five of which Mr. Fitch does not seem to have met with in his researches, although Dr. Power seems to have come across some of them. The first is the curious and spider-like *Niptus hololeucus*, Fald., covered with its golden pubescence, of which I found four, followed by the rare *Monotoma quadrifoveolata*, Aub., seventeen in number; neither of these seem to have been observed by Mr. Fitch, or their companion *Alphitobius piceus*, Ol. (five). The shining chestnut-brown *Gibbium scotias*, Fab., was represented by two specimens only, while *Ptinus fur*, L., numbered some fourteen. *Tribolium ferrugineum*, Fab., was in large numbers; but of *T. confusum*, the rarer of the two, I only found three specimens, although I took especial pains in hope of finding more. Now follows a species which is neither in Cox's 'Handbook of Coleoptera' nor Dr. Sharp's 'Catalogue,' and neither Dr. Power nor Mr. Fitch seems to have met with it. This is a small distinct form of *Lœmophlœus.* Mr. Waterhouse is of opinion that it can be no other than *L. pusillus*, Schön., of Waterhouse's and Rye's Catalogue, or the *L. minimus* of Stephens, and which he speaks of as occurring in and near London, in warehouses, &c.: it is not improbable that the smallness of this insect caused it to be overlooked by the before-mentioned gentlemen, it not being above half a line in length, and when turned out on paper it for a long time feigns death, so that it might easily be passed over; of this I found about forty specimens, some of which may now be seen in the British Museum Collection.

The last of my coleopterons found on this occasion is the new addition to our fauna, but there seems to be some doubt about its being truly indigenous. This insect appears to have been met with before, but only solitary individuals; and I believe specimens have been in the British Museum Collection for some years, but without any name. Occurring to me as it did, this drew the attention of other coleopterists to it, and, after a careful examination, Mr. C. O. Waterhouse has described it as a new genus and species of heteromerous Coleoptera, under the name of *Latheticus oryzæ;* his description will be found published in the 'Annals and Magazine of Natural History' for February, 1880.

Dr. Power is of opinion that *Latheticus*, being an imported insect, can scarcely be said to be naturalised. This is probable, but in any case it is in a fair way to establish itself in our storehouses, for the number I met with in the small sample from the granaries, sent to me by Mr. Fitch, was over forty. It has also been met with by Mr. V. R. Perkins in a sample of wheat from Croydon, and in other places since. My last coleopteron brings the total number of *Calandra's* associates found by myself to eighteen distinct species, irrespective of *C. granaria* and *C. oryzæ;* and with Mr. Fitch I quite think the store is not yet exhausted, and will well repay further labours. As usual, this sample contained a large quantity of *Acaridæ*, as also of various larvæ, probably coleopterous, and some eight or nine specimens of immature Hemiptera; but of hymenopterous parasites I saw none, although I kept the refuse nearly six months.

The following is a complete list of the Coleoptera found:—

Calandra granaria, *Linn.*
C. oryzæ, *Linn.*
Trogosita mauritanica, *Linn.*
Læmophlœus ferrugineus, *Steph.*
L. pusillus, *Schön.*
Silvanus surinamensis, *Linn.*
Monotoma quadrifoveolata, *Aube.*
Typhæa fumata, *Linn.*
Ptinus fur, *Linn.*
Niptus hololeucus, *Fald.*
Gibbium scotias, *Fab.*
Rhizopertha pusilla, *Fab.*
Alphitophagus qradripustulatus, *Steph*
Tribolium ferrugineum, *Fab.*
T. confusum, *Duval.*
Latheticus oryzæ, *C. O. Waterh.*
Hypophlœus depressus, *Fab.*
Alphitobius piceus, *Oliv.*
Tenebrio molitor, *Linn.*
T. obscurus, *Fab.*

4, Swiss Villas, Coplestone Road, Peckham, S.E., August 6, 1880.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

By John B. Bridgman and Edward A. Fitch.

No. II.—ICHNEUMONIDÆ (*continued*).

Section 8.—Scutellum pale; abdomen red or red and black.

A. Abdomen red, basal segment (and rarely the apex) black (females).
a. Scutellum yellow or yellowish white.
* Two marks before, and lateral margins of, scutellum more or less whitish.
† 2nd abdominal segment not longer than wide.
14. *rufinus*, 5 lines (*t, s, l*).
†† 2nd segment somewhat longer than wide.
10. *lineator*, 6—8 lines (*t, s, l, a*).

** Scutellum without the marks in front.
‡ Hind tibiæ with a white ring. 106. *albicinctus*, 3—4 lines (*h*).
‡‡ Hind tibiæ without a white ring; femora generally black; tibiæ pale; apex black.
§ Scutellum and marks on thorax yellow.
× Yellow mark before and beneath the wings; hind coxæ beneath nude.
1. *pisorius*, 11—12½ lines (*l*, *a*).
× × Yellow marks beneath the wings only.
123. *exspectatorius*, 10½ lines.
§§ Scutellum and other marks white or whitish; hind coxæ pubescent.
× × × Pale line before the wing; supero-medial area of metathorax deeply emarginate at the apex. - 3. *similatorius*, 9—10 lines (*l*).
× × × × No pale line before the wings; supero-medial area of metathorax truncate at the apex. - 4. *Coqueberti*, 9—10 lines.
b. Scutellum more or less red.
o Red line before the wings; ovipositor ⅓ the length of the abdomen; tibiæ partly red. - - 81. *lanius*, 4—5 lines (*s*).
oo No red line before the wings.
+ Ovipositor slightly projecting; femora red or black, tibiæ red.
100. *castaneus*, 4½—5½ lines (*s*, *l*, *a*).
+ + Ovipositor ⅓ the length of the abdomen; front tibiæ reddish, scutellum sometimes black. . - 82. *albilarvatus*, 4½ lines.
B. 2nd and 3rd abdominal segments only, more or less red (females). Lateral margins of scutellum white, femora and tibiæ red.
26. *scutellator*, 5—6 lines.
C. 1st to 4th abdominal segments red, base of 1st sometimes more or less black (females).
a. Scutellum white; gastrocæli indistinct.
* Scutellum entirely white; post-petiole entirely punctated; tibiæ red.
105. *semirufus*, 3½—4 lines.
** Apex of scutellum only, white; post-petiole strongly punctated, apex smooth; legs red and black varied.
83. *vacillatorius*, 2½—3 lines (*s*, *l*).
b. Scutellum whitish yellow, base red; post-petiole rather smooth; front or all femora red; tibiæ red. 101. *defraudator*, 4 lines.
D. Apical margins of 2nd—4th segments, 6th—7th entirely red; or greater part of abdomen red; basal keels of scutellum white (females).
† Areolet towards the costa narrow. - 16. *ruficaudus*, 7 lines.
†† Areolet towards the costa wide. 10. *lineator*, 6—8 lines (*t*, *s*, *l*. *a*).
A. Hinder tibiæ black with a white ring (males).
106. *albicinctus*, 3—4 lines.
B. Hinder tibiæ without a white ring (males).
a. Abdomen red, 1st segment entirely black, or apex red.
* Basal keels before the scutellum not pale marked.
† Scutellum and marks on thorax yellow. 1. *pisorius*, 11—12½ lines.
†† Scutellum and marks on the thorax white or whitish.
(Supero-medial areæ as in the females).
‡ White line before and beneath the wings.
3. *similatorius*, 9—10 lines (*l*).
‡‡ White line beneath the wings only. 4. *Coqueberti*, 9—10 lines.
** Basal keels before the scutellum marked with white.
10. *lineator*, 6—8 lines (*t*, *s*, *l*, *a*).

b. Apex of abdomen, or base and apex, black, sometimes the middle segments more or less so.
§ Front coxæ and trochanters entirely white or whitish.
× Two large white spots on the breast. - 81. *lanius*, 4—5 lines.
× × Breast without white spots.
o Scutellum white on the apex; front femora and tibiæ yellow-red, hinder pair darker; apex of tibiæ brownish.
134. *niveatus*, 2½—3 lines.
oo Scutellum whitish yellow; base red, legs pale red.
101. *defraudator*, 4 lines.
§§ Front coxæ spotted with white or yellow.
→ Middle area of post-petiole striated; tibiæ partly pale.
•• Face entirely whitish yellow. - 51. *piceatorius*, 7 lines.
•••• Face with central black mark. 30. *computatorius*, 6—9 lines (*h*, *s*, *a*).
→ → Middle area of post-petiole punctated.
∽ Gastrocœli of 2nd abdominal segment obsolete.
83. *vacillatorius*, 3½—4 lines (*l*).
∽∽ Gastrocœli distinct and small; greater part of legs dark.
96. *derogator*, 4 lines.
→ → → Middle area of post-petiole smooth; gastrocœli occupying nearly the entire base of the 2nd abdominal segment.
102. *exornatus*, 4—6 lines.
§§§ Front coxæ black, or at the most partly red.
a. Vertical orbits not marked with white.
* Middle area of post-petiole aciculate.
2nd and 3rd abdominal segments red, or sometimes red maculated.
† 3rd segment of abdomen subquadrate.
30. *computatorius*, 6—9 lines (*a*).
†† 3rd segment transverse.
‡ Gastrocœli of 2nd segment wide, the space between them slightly narrower or equal to the middle area of the post-petiole.
50. *gracilicornis*, 6—8 lines (*h*, *s*, *a*).
‡‡ Gastrocœli moderate, the space between them rather wider than the middle area of post-petiole.
57. *raptorius*, 3½—5 lines (*h*, *t*).
** Middle area of post-petiole closely punctated.
Apex of 1st, 2nd–4th, and sometimes part 5th, abdominal segments red, 4th often with a fuscous mark in the centre.
97. *bilunulatus*, 2½—4 lines (*h*, *t*, *a*, *l*).
*** Middle area of post petiole scabrous.
§ 3rd abdominal segment red. - 115. *cinctorius*, 7 lines.
§§ 1st—3rd segments red, base of 1st sometimes black.
100. *castaneus*, 4½—5½ lines.
b. Vertical orbits marked with white.
* Middle area of post-petiole aciculate.
Abdomen red, basal segments more or less black, apex red; femora and tibiæ red, apex of hinder dark
→ Basal keels of scutellum and its lateral margins whitish.
•• Areolet towards the costa narrow. - 16. *ruficaudus*, 7 lines.
•••• Areolet towards the costa wide
∽ 2nd segment not longer than wide. - 14. *rufinus*, 5 lines (*l*).
∽∽ 2nd segment somewhat longer than wide.

Scutellum with two white apical spots.
10. *lineator*, 6—8 lines (*t*, *s*, *l*, *a*).

++ No pale marks before the scutellum.
19. *castaneiventris*, 5½—8½ lines, (*l*, *a*).

** Post-petiole entirely punctated.

† Gastrocæli scarcely any. 1st—4th abdominal segments and tibiæ red, apex of hinder one black. 105. *semirufus*, 3½—4 lines.

†† Gastrocæli small, but tolerably distinct; middle of abdomen, and apex of 1st segment sometimes, red; legs vary; generally a pale line before and beneath the wings.
97. *bilunulatus*, 2½—4 lines (*h*, *t*, *l*, *a*).

SECTION 9.—Scutellum black, abdomen red or red and black.

A. Abdomen red, basal segment more or less black (females).

a. Antennæ white-ringed; greater part of legs black.
Post-petiole smooth, gastrocæli none.

* Petiole pitchy. - - - - 126. *gasterator*, 4—5 lines.

** 1st segment black, apex sometimes red.
75. *coruscator*, 3½—4½ lines.

B. Middle of abdomen entirely red (females).

a. Frontal orbits pale; front femora, tibiæ, tarsi, and apex of hind tibiæ red. - - - - 13. *hæsitator*, 4 lines.

b. Frontal orbits black; legs dark; tibiæ red (*) or obscure red (**).

* Gastrocæli moderately deeply impressed.
23. *culpator*, 7—10 lines (*a*).

** Gastrocæli scarcely impressed; front femora and tibiæ with whitish marks. - - - - - 103. *apricus*, 4½ lines.

C. Margins of all the segments and legs red.
129. *maculicornis*, 2½ lines.

D. 2nd segment red, 3rd—6th more or less marked with black, 7th red or black, legs more or less red or black.
19. *castaneiventris*, 5½—6½ lines (*l*, *a*).

E. Four basal segments light pitchy red; legs red, hind coxæ faintly spurred. - - - - 138. *picipes*, 2½ lines.

F. Four basal segments bright red; tibiæ and femora red, apex of hinder one black. - - - 124. *femorator*, 5 lines.

A. Antennæ white-ringed, or some of the middle joints marked with white above (males).

a. Thorax without white marks; middle of abdomen red; legs dark.

* Face black. - - - 23. *culpator*, 7—10 lines (*ant*).

** Face white. - - - 82. *albilarvatus*, 4¾—5 lines (*a*).

b. Thorax with white marks against the wings; margins of all the segments and legs red. - 129. *maculicornis*, 2½ lines.

B. Antennæ without white marks in the centre (males).

a. Face and thorax with white marks.

* Basal segments of abdomen black; apical ones, femora, tibiæ, and tarsi red. - - - 131. *melanopyrrhus*, 7½ lines.

** 2nd segment and basal angles of 3rd red; legs black, front ones with whitish marks - - - 103. *apricus*, 4½ lines.

b. Face and clypeus more or less white; thorax black; base of hind femora and tibiæ red. - 45. *latrator*, 2½—3½ lines (*a*).

c. Face and thorax without white marks.

† Basal segment of abdomen black, legs red, hind coxæ fuscous at the base. - - - - 109. *abdominator*, 4½ lines.
†† 2nd and 3rd segments red, 3rd sometimes with a black line (⁝⁝).
⁝ Tibiæ sometimes sordid red or piceous.
23. *culpator*, 7—10 lines (*antæ*).
⁝⁝ Base and apex of hind femora red; tibiæ red, apex of hinder one black. - - - - - *vulneratorius*, 3½—4 lines.
††† 2nd—4th segments red; antennæ beneath, base of hind femora and tibiæ, red. - - 45. *latrator*, 2½—3½ lines (*h, s*).
†††† 2nd—5th segments red, margins of 6th reddish; front tibiæ only pale. - - - - - - 142. *rufator*, 5 lines.

Section 10.—Scutellum pale; abdomen with pale spots, or some of the segments marked with, or entirely, yellow; apex of abdomen black.

A. Antennæ with a white ring (females).
a. Abdominal segments 1st—4th, or 5th, with pale lateral spots. Hind legs black.
* Hinder coxæ without pubescence beneath.
5. *Bohemani*, 8—12 lines.
** Hinder coxæ pubescent beneath. 6. *sugillatorius*, 6—8 lines (*t*).
b. 2nd—3rd, or 4th abdominal segments with lateral white spots, 1st segment quite black. - - 7. *cyaniventris*, 6 lines.
B. 2nd—13th, or 14th joints of antennæ pale, the rest black (females). 2nd abdominal segment rufo-fulvous, 3rd yellow-edged, 6th nearly all pale yellow; femora and tibiæ reddish yellow.
128. *lautatorius*, 6—6½ lines.
A. Basal segment only with white lateral spots or a streak (males).
* Anterior coxæ white, as well as sides of scutellum; femora and tibiæ red. - - - - - - 12. *mæstus*, 4 lines.
** Anterior coxæ black, as well as femora.
† Greater part of hind tarsi white. - 86. *leucomelas*, 6—7½ lines.
†† Hind tarsi fuscous. - - 113. *bipunctorius*, 7—8 lines.
B. Several of the basal segments with pale lateral spots (males). Legs black; anterior tibiæ only partly pale.
⁝ Abdomen lanceolate. - - - 7. *cyaniventris*, 6 lines.
⁝⁝ Abdomen linear (antennæ sometimes white-ringed).
6. *sugillatorius*, 6—8 lines (*t*).
a. 1st—3rd abdominal segments entire margins, 4th—5th lateral margins, white.
Legs black, front tibiæ partly whitish.
24. *multicinctus*, 4¾—6 lines (*a, l*).
b. 1st—4th segments yellow, base of each more or less black.
Legs yellow with black marks. - 33. *xanthorius*, 6½—8 lines.
c. 1st—3rd segments straw-coloured at their apical margins.
* A straw-coloured spot on the mesosternum; gastrocœli obsolete; post-petiole alutaceous. - 78. *jugatus*, 5—6 lines.
** No pale spot on the mesosternum; post-petiole smooth.
76. *varipes*, 2—3½ lines.
d. Apical margins of 2nd and 3rd segments pale; post-petiole more or less punctated; hind legs dark.
85. *dumeticola*, 5—6 lines.

e. 2nd and 3rd segments entirely yellow; hind femora black; tibiæ yellow, apex of hinder one black.

* 3rd abdominal segment transverse. - 54. *caloscelus*, 5—6 lines.

** 3rd segment subquadrate.

† Margins of cheeks subdilated or reflexed below the base of the mandibles.

‡ Apex of clypeus truncated. - 35. *bucculentus*, 6—9 lines (*a*).

‡‡ Apex of clypeus slightly emarginate and depressed. 36. *suspiciosus*, 6—9 lines.

†† Margin of cheeks not dilated below the base of the mandibles.

§ Frontal orbits marked with yellow.

× Front coxæ and trochanters black or spotted with yellow. 37. *gracilentus*, 5—6 lines (*a*).

× × Front coxæ and trochanters entirely yellow. 40. *inquinatus*, 6½ lines.

§§ Frontal orbits not marked with yellow; front coxæ black.

o Mouth, clypeus, and face yellow. - 34. *confusorius*, 6—7 lines.

oo Sides of face, and sometimes two spots near the upper part yellow. 42. *luctatorius*, 6—8 lines.

§§§ Vertical orbits as well as mouth, and face yellow; front coxæ, trochanters, and femora black, more or less yellow at the apex (the yellow segments have at times a black triangular spot). - - 121. *dissimulator*, 9—10 lines (*a*).

f. 2nd and 3rd abdominal segments yellow, more or less marked with black.

* Hind legs black, tibiæ with a whitish streak towards the base.

Apex of 1st, 2nd, and 3rd segments yellow, 2nd with two black dots on the disc. - - - 112. *binotatus*, 4 lines.

** Hind legs, black and yellow variegated.

† External orbits without pale marks.

‡ 3rd abdominal segment with a short basal black band; 3rd segment subquadrate. - 38. *terminatorius*, 6—9 lines.

‡‡ 2nd and 3rd segments more or less black at the base; 3rd segment transverse. - - 28. *molitorius*, 6—9 lines (*a*).

‡‡‡ 2nd and 3rd segments with a subtriangular dorsal black mark. 41. *bisignatus*, 8 lines.

‡‡‡‡ 2nd segment pitchy red, basal sides and a transverse line before the margin black; 3rd extreme margin and lateral spot obsoletely stramineo-ferruginous. 51. *piceatorius*, 6 lines.

†† External orbits pale marked.

Abdomen varies from 2nd—3rd segments more or less yellow, or abdomen yellow, apex black, to quite black; gastrocæli none. 75. *coruscator*, 4—6 lines.

g. 2nd—4th abdominal segments yellow, 4th sometimes marked with black.

* Femora almost entirely yellow. 48. *primatorius*, 10—11 lines.

** Greater part of femora black. - 44. *minutorius*, 4—4½ lines.

SECTION 11.—Scutellum pale, apex of abdomen, and most of the middle, spotted with yellow, or with yellow or white bands.

A. Antennæ white-ringed (females).

a. All the segments with pale margins; greater part of legs yellow (*) or orange (**).

* Margins of segments and marks on thorax yellow.
33. *xanthorius*, 5—6½ lines.
** Margins of segments and marks on thorax whitish.
137. *phaleratus*, 3½ lines.
b. 2nd and 3rd segments yellow, orange, or red; 5th, 6th, and 7th with a yellow dorsal spot; tibiæ straw-coloured, apex of hinder one black. 38. *terminatorius*, 6—9 lines.
c. 1st—3rd or 4th segments testaceous at the edges; legs dark.
77. *luteiventris*, 6—8 lines.
A. Antennæ, basal half bright yellow, the rest black (males).
2nd abdominal segment with two yellow spots; 6th and 7th whitish yellow, legs yellow, hind coxæ and trochanters partly, and apex of femora and tibiæ, black.
120. *dimidiatus*, 5½ lines.
B. Antennæ black (males).
a. Abdomen and legs testaceous; petiole and hind coxæ black.
77. *luteiventris*, 6—8 lines.
b. All the abdominal segments with pale edges; legs as in the females.
* Marks on thorax and abdomen yellow.
33. *xanthorius*, 5—6½ lines (*a*).
The last segments of this species are sometimes without the pale margins.
** Marks on thorax and abdomen whitish.
137. *phaleratus*, 3½ lines (*b*).
c. 2nd, 3rd, 6th, and 7th abdominal segments with the entire margins; 4th, the margin interrupted in the middle, yellow; femora, tibiæ, and tarsi orange, apex of hinder black.
32. *vaginatorius*, 5—6 lines.
d. 2nd segment rufo-fulvous; the remaining ones yellow-edged; femora and tibiæ reddish yellow.
128. *lautatorius*, 6—6½ lines.

SECTION 12.—Thorax red, or partly red with pale markings; abdomen bicoloured, or tricoloured.

A. Abdomen red, base black; sometimes the apex brownish.
* Thorax testaceous. 91. *flavatorius*, 7—9 lines, male and female.
** Thorax red, variegated with sulphur and black.
102. *exornatus*, 4—6 lines, female (*a*).
B. Abdomen red, apex black, anus white.
Antennæ with a white ring.
a. Metathorax with more or less red.
107. *erythræus*, 3—4 lines, male and female.
b. Metathorax black.
* Sides of thorax red. 141. *rubedinis*, 4½ lines, female.
** Sides of thorax and breast black.
† Greater part of the head red. 98. *ruficeps*, 4—5 lines, female (*t*).
†† Head black, face sometimes with a red mark.
vulneratorius, 3½—4 lines, female (*h*, *t*, *s*, *l*, *a*).
C. Abdominal segments 1st and 4th partly, 2nd and 3rd entirely, red, as well as part of mesothorax; scutellum, tibiæ, and tarsi, apex of hinder one, brown. 108. *Walkeri*, 4 lines, female.

(To be continued.)

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Vanessa Antiopa near Birmingham.—On Sunday, August 22nd, when coming from church, I distinctly saw, in the park here, two *V. Antopia.* They were flying towards some willows which were close by. I went and fetched my net, but unfortunately did not see them again. I have since heard that another has been seen in the neighbourhood, so I hope soon to be able to record the capture of this periodical insect.—Sir Arthur Scott, Bart.; Great Barr Hall, near Birmingham, August 24, 1880.

Vanessa Antiopa at Dulwich.—News of the reappearance of so rare a butterfly as *Vanessa Antiopa* in the neighbourhood of its old locality cannot but be interesting to your readers. Whilst collecting in the neighbourhood of Dulwich, on the 17th instant, I had a clear sight of this fine lepidopteron. To my dismay it retreated over a fence, and on my succeeding in scaling the barrier it was nowhere to be seen.—G. Vernon Hudson; 1, Busby Place, Camden Road, N.W., August 24, 1880.

Vanessa Antiopa at Wimbledon.—Yesterday (August 24th), whilst working up Wimbledon Common, I captured a splendid specimen of *V. Antiopa* at rest on *Vaccinium.* The afternoon was warm and cloudy, with a gentle wind blowing.—Thos. Humble Ralfe; Shrewsbury Road, Bayswater, W.

Vanessa Antiopa at Folkestone.—I captured *V. Antiopa* in the Warren yesterday, August 22nd; I understand it has been seen in other parts.—William Purdey; 115, Sea View Terrace, Folkestone.

Argynnis cleodoxa.—I captured near this place, last Wednesday, the 11th inst., a very fine and perfect specimen of the variety *Cleodoxa* of *Argynnis Adippe.*—H. W. Law; The Chase, Ross, Herefordshire, August 13, 1880.

Colias Edusa.—This butterfly may now be seen flying over turnips and stubbles, but not nearly so abundant as it was a few years since. I have not seen the var. *Helice* as yet.—H. Reeks; Thruxton, August 20, 1880.

Polyommatus Phlæas.—About the middle of July my sister captured the by no means common variety of the above species without the copper-coloured band on the hind wings, having a red pencil-like mark in lieu thereof.—R. M. SOTHEBY; Rozel, Upperton Gardens, Eastbourne, August 19, 1880.

PUPÆ OF DEILEPHILA EUPHORBIÆ EMITTING SOUND.— I had four pupæ of this insect sent from Germany; all have now produced imagines. It was my practice occasionally to moisten them, and when placing one in water I distinctly heard it hiss; the sound was repeated several times, and resembled that of a snake.—J. JENNER WEIR; 6, Haddo Villas, Blackheath, London, S.E., August 16, 1880.

RARE LEPIDOPTERA COLLECTED IN 1880.—I have again had the good fortune to take *Nola centonalis* in the same locality as in 1879; but although I worked the place very closely indeed for five weeks, could only meet with it most sparingly, and failed entirely to get any eggs. I took one pair *in cop.*, but the female would not oblige me with a single egg. Another of my most interesting captures was *Acidalia ochrata*, and from eggs then obtained have now larvæ feeding. This insect has not yet been bred in this country. During June last I bred, from larvæ collected by myself in Sussex, a few beautiful specimens of *Sesia spheciformis* from alder.—W. H. TUGWELL; 3, Lewisham Road, Greenwich, August 23, 1880.

CALLIMORPHA DOMINULA.—On July 18th, and the following days, the imagines of *Callimorpha dominula* swarmed in hundreds near a small wood on Tenby Common, near Sherborne, Dorsetshire.—CHARLES E. M. INCE; Shepherd's Bush, W.

CAPTURES NEAR YORK.—The present season has been, in this district, the best of any for the last eight or ten years. Amongst the most unusual species taken in the neighbourhood is *Aplecta occulta*. During last week I had the pleasure of capturing a nice series of the light-coloured form at Sandburn Wood, which, as many of your readers know, is some seven miles to the east of the city. In the same neighbourhood, at the same time, I took some eight specimens of *Cidaria immanata*, many beautiful varieties occurring amongst them; also about sixty *Scoparia truncicolalis*, besides several other odd things. In June last I visited Edlington Wood, near Doncaster, and had good sport with *Asthena sylvata*, taking a long and handsome series; with about forty *Melanippe hastata*. One of the latter was a good variety. At the same time I got two good varieties of *Abraxas ulmata.* During the last fortnight I have taken over one hundred and fifty very fine *Orthosia suspecta*, and, of course, our old friend *Epione vespertaria.* This season we cannot work Askham bog, our piece of marsh-land; but Sandburn has well repaid the time spent in working for Lepidoptera. Amongst many others I have taken long and handsome series of *Ellopia fasciaria, Macaria liturata, Triphæna fimbria;* besides *Aplecta herbida, Pericallia syringaria, Geometra papilionaria, Scotosia undulata;* a pair of *Notodonta dictæoides* just out of pupæ on a birch tree; *N. trepida;* two *Sesia culiciformis*, which is rare here; *Lobophora lobulata* and *Eupithecia indigata*, about fifty each. In July I got several very fine *Boarmia roboraria* at Cawood. But the strangest insects I have taken this season were a *Zeuzera Æsculi*, at rest at Sandburn,—I never remember this species occurring in this district before,—and a specimen of *Sirex gigas* at sugar, also at Sandburn. Taking all into consideration, I have had as yet no cause to complain of the season of 1880.—WILLIAM PREST; 13, Holgate Road, York, August 16, 1880.

LATE APPEARANCE OF CYMATOPHORA FLUCTUOSA.—Whilst beating for the larva of *C. fluctuosa* at West Wickham, on the 17th August, I was surprised on finding a fine specimen of the perfect insect of that species in my umbrella. The larva was at the same time full-fed. I also beat, on the same day, larvæ of *Stauropus fagi, Notodonta dodonæa, N. dromedarius, Eurymene dolabraria*, &c.—W. J. HARPER; 66, Mansfield Street, Kingsland Road, London, August 18.

A WEEK'S LARVÆ-BEATING IN THE NEW FOREST.—My brother having just returned from Brockenhurst, a record of his captures might be of interest to some of the readers of the 'Entomologist' having an idea of visiting that locality during the autumn. Although, generally speaking, larvæ were scarce, a few good things fell to his net. *Acronycta alni*, six; five of these were from beech, and one from oak. *Stauropus fagi*, seven; *Diphthera Orion*, about thirty. *Notodonta dodonæa, Acronycta leporina* and *Demas coryli* were common, as were also several other species. Perfect insects were very scarce; nevertheless he obtained a fine series of *Cleora glabraria. Lithosia quadra* and *Catocala sponsa*, several. Butterflies were all wasted. Sugar produced only a few *Triphæna fimbria* and *C. sponsa.*—ID.

Scotosia vetulata at Hampstead.—On June 2nd, at Hampstead, I found about thirty larvæ of *S. vetulata.* They were then nearly full grown, and in the course of a day or two changed to pupæ, from which, on July 1st, two dozen imagos emerged. I believe that this is a new locality.—P. F. Alexander; Ivy Cottage, Lower Heath, Hampstead.

Emmelesia unifasciata two years in Pupa.—In December, 1878, I received, from a London correspondent, half-a-dozen pupæ of *E. unifasciata.* From these one or two moths emerged in August, 1879. Of the remainder, one to my surprise produced a perfect imago in July of this year. Is this at all usual? or is it another evidence of the abnormal character of the weather last year?—Chas. F. Thornewill; The Soho, Burton-on-Trent, August 19, 1880.

[Very little is known about this subject. It is probable that most species of Lepidoptera do, under abnormal circumstances, remain in the pupa state for very long periods. A series of experiments with pupæ ought not to be difficult to conduct, and would be of great interest.—Ed.]

Capture of Tinea albipunctella, &c., at Witherslack.—I spent four days at the above place, from the 4th to the 8th of August, 1880. The weather only let me have about three hour's collecting each day. By diligent work I took a fair lot of specimens. *Scoparia truncicolalis* in swarms; a *Scoparia* n. s. very distinct. Plenty of *Argyresthia aurulentella* and *Andereggiella;* a few *Sciaphila penziana*, and *Amphysa gerningana* in plenty; one *Asychna profugella*, and a few *Zelleria hepariella. Tinea albipunctella* has puzzled me for the last twenty years. During all that time I have taken perhaps a dozen specimens. I was determined to find out more about it, if possible; so I worked about where I took four specimens, and succeeded in taking ten, and ultimately found a few empty cases protruding from fungi on an old stump. It was only the last hours that rewarded my search for so many years. The sticks and stumps that have been broken up in search of this species must have been a big cart-load. Next year I shall bring the old stumps home, and hope to rear some imagos from them.—J. B. Hodgkinson; Preston.

Chrysoclista bimaculella.—My sister, while at Hastings, was fortunate in taking, about the middle of last month, a beautiful specimen of this *Tinea*, which Mr. Stainton pronounces to be very rare.—R. M. Sotheby; Eastbourne, Aug. 19, 1880.

Sugaring at Croydon.—Having heard that somewhat poor results have attended this year's sugaring, even in the most favoured localities,—in some cases not a single specimen of the most common species having been met with,—it may not be entirely without interest to some of your readers if I give the results of a few observations made whilst sugaring in a very limited locality, namely, my own garden. Although it is somewhat difficult to write anything new on this subject, still there are sometimes facts worth noting when working limited areas, which are not only interesting to the general naturalist, but also of some practical use to the entomologist in particular. Being desirous of making a list of the number of species of Lepidoptera which could be taken in one season in one small locality, in the neighbourhood of Croydon, I, amongst other things, resorted to sugaring the fruit and other trees in my garden. The area is about a quarter of an acre of ground, well made use of, and containing a considerable number of trees and shrubs. This position is high and very much exposed, both to south-west and also to northerly and easterly winds. The surface soil is very light, and the strata are the sand-beds of the "Oldhaven series." So much for its features. The number of trees usually sugared was seven, *viz.* laburnum, cherry, hawthorn, holly, plum, apple, and pear. I selected a variety of species, as also a variety of positions, in order to note the peculiarities, if any, that might exist with regard to a liking for any particular spot or tree. I also carefully noted the meteorological aspects, the results of which I give. Although I have as yet taken nothing particularly rare, still I have had fairly good sport, and quite sufficient to arrive at data as to positions and weather aspects likely to prove of use hereafter. During four weeks' sugaring in July and August, at the rate of three nights per week, I have met with the following species in the locality above referred to, most of them in considerable numbers:—*Mamestra brassicæ*, *M. persicariæ*, *Agrotis nigricans*, *Triphæna fimbria*, *Catocala nupta*, *Mania maura*, *Triphæna orbona*, *T. pronuba*, *Cosmia diffinis*, *Euplexia lucipara*, *Hadena oleracea*, *Mania typica*, *Acronycta psi*, *Xylophasia polyodon*, *X. lithoxylea*, and *Dipterygia pinastri*. As regards the state of the weather I have found that what are considered bad nights have proved unusually good, and *vice versâ*, as the annexed form will show. Eight selected nights, with notes on results:—

1. Wind S. Sultry and close. Very few; only on exposed trees.
2. S.W. Rather damp. Specimens, five trees out of seven (fairly good).
3. S.W. Heavy rain. Very good till rain washed the sugar off.
4. N.W. Windy. Good where the slightest shelter existed.
5. N.W. Calm and dull. Scarcely any.
6. N.E. Rather cold and dry breezes. Good.
7. N.E. Cold drizzle and choppy wind. Best result of any.
8. W. Warm, and moon. Good at first; after, nothing.

By this it will appear that a cold and damp north-east wind was blowing on the most satisfactory night, both as regards species and numbers; whilst a close evening with a south-west wind was not nearly so good. The favourite trees were the plum and holly; but most likely their position was most advantageous, although apparently such was not the case. Exposed positions seemed preferable to confined ones, owing no doubt to the scent being carried by the wind from the former when it could not reach the latter. One disadvantage of a garden is the number of semi-domesticated insects, to say nothing of Mollusca and Crustacea, in the shape of snails, slugs, woodlice, &c., which infest the sugar, to the exclusion of more valued, but more bashful "game." I use the word semi-domesticated, as I have never yet met with such numbers of the above referred to pests in the woods and forests as occur when sugaring on cultivated grounds or gardens. In fact, ants, spiders, snails, woodlice, and such like, seem to be as closely connected with, and benefited by, civilisation as is the ubiquitous sparrow.—Edward Lovett; Holly Mount, Croydon, July 15, 1880.

Clothes' Moths.—In 'Entomologist,' 1878, p. 212, reference is made to four species of destructive moths, which are respectively described by the English names of clothes', carpet, fur, and hair moths. Three of these *Tineæ—vestianella, tapetzella, pellionella*—are also referred to by Kirby and Spence, who further name *Laverna sarcitella* and *Galleria mellonella*. Is either of these last a synonym of *Tinea crinella*, which is the fourth insect referred to in the 'Entomologist'? A most abundant insect here is the white-headed clothes' moth (*Endrosis fenestrella*). I should like to know if this is identical with either of the moths in the above list, or if it is omitted because less destructive than those named. It would also be helpful to know under what names Stainton describes *Vestianella*, *Sarcitella*, *Crinella*, and *Mellonella.*—W. MACMILLAN ; Castle Cary, Somerset.

[*Endrosis fenestrella*, Stainton's 'Manual,' ii. 359, is known on the Continent as *E. lacteella* of the Vienna Catalogue (Schiffermiller and Denis). This moth must *not*, however, be confounded with *Laverna lacteella*, Steph. ('Manual,' ii. 398)—a very different species. Although Riley mostly uses the Stephensian names, *Laverna sarcitella*, Stephens, is *Endrosis fenestrella*. *T. vestianella*, Stephens and Wood, is *T. rusticella*, Hübner ; 'Manual,' ii. 290. *T. crinella*, Treitschke, Duponchel, &c., is *T. biselliella*, Hummel ; 'Manual,' ii. 293 ; also of the late Mr. Healy's life-history at Entom. iv. 194—6. This is *T. destructor* of Stephens. *Mellonella* (the wax moth) is a *Galleria*, and described under that name in the 'Manual' (ii. 164). Linné described the two sexes as distinct species—the male as *cereana ;* the female as *mellonella.* Stephens used the former name.—E. A. F.]

EXTRAORDINARY ABUNDANCE OF WASPS IN THE STEWARTRY OF KIRKCUDBRIGHT.— The proverbial oldest inhabitant cannot remember a year when wasps were in such enormous multitudes as they are here this season. I have heard of several places where the nests were so numerous, and their inmates so aggressive, that the haymakers were ignominiously chased from the field. Last week we counted sixteen nests on a measured half acre of meadow hay at Dalscairth. On about one hundred yards of the adjoining public road we counted, on the roadsides, upwards of thirty-five nests. On an avenue of about three hundred yards in length, leading to a gentleman's mansion, upwards of seventy nests were seen, and in and around a walled garden of about three acres in extent nearly forty nests were found. It is positively dangerous to leave the pathways in the copse-woods—nests of *Vespa norvegica* and *V. sylvestris* hang in every thicket, and a very slight disturbance of their household suffices to bring out a swarm of angry warriors. These are fair instances of what this county produces this year in the wasp line. Of the ground-builders, *V. germanica* is the most numerous species ; next comes *V. vulgaris*, and *V. rufa* is in limited numbers. In the meantime the wasps may be considered as beneficial to various interests ; and we know a large fruit garden, where the trees were badly infested with "mussel-scale," which has been almost entirely cleared off. The industry shown by the wasps in hunting up the few remaining specimens is most interesting to watch. Aphides even on the beech hedges may be considered as quite destroyed for a season, and Diptera show a most marked diminution in numbers, entirely attributable, in my opinion and in that of several other observers here, to the wasps. In the summer of 1878 we also had the wasps in exceptional numbers; in the summer of 1879—if we can term such a season as last a "summer"—the finding of a wasp's nest was a rare event. Is it possible that the female wasps can have laid dormant since the autumn of 1878 till this spring? I would be very unwilling to believe that so many females were reared last season as would produce such a crop of nests as we find this year. If we have no weather, or other cause that will check their increase, the next few weeks will be disastrous for fruit-growers and bee-keepers. As yet the wasps have refrained from injuring the small fruit, but we can hardly expect that they will be so forbearing when the large fruit ripens. Bee-keepers will require to be on the alert to prevent plundered hives.—ROBT. SERVICE; Corberry Nurseries, Maxwelltown, N.B.

ABUNDANCE OF WASPS AND ICHNEUMONIDÆ.—I have not for many years seen such an abundance of wasps' nests as there is this year. Those that I have destroyed were nests of *Vespa vulgaris* and *V. germanica*, which occur in about equal proportion. I was too late for *V. rufa* and *V. sylvestris;* both are generally common in this neighbourhood. Coleopterists who want the rare *Rhipipiphorus paradoxus* will now find it in the nests of *V. vulgaris*. I noticed one this morning when digging out a nest of that species. As an agriculturist I am glad to see the extraordinary number of Ichneumons. Every plant seems covered with them, searching for larvæ. They will prove a great nuisance to breeders of insects, as three-fourths of the larvæ I have collected were infested.—HENRY REEKS; Thruxton, August 20, 1880.

SOUTH OF SCOTLAND ENTOMOLOGICAL SOCIETY. — We are pleased to see that a society bearing the above title was established at Galashiels last February. This society is, we believe, the only one of its kind existing in Scotland. Its members number about a score, and it has already held one exhibition of specimens relating to Entomology in connection with a horticultural society at Galashiels. We wish the venture every success. All information relating to it may be obtained from the Secretary, Mr. JOHN CLAPPERTON, Bridge Street, Galashiels.—ED.

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ADDITION OF *BRYOPHILA PAR* TO THE BRITISH FAUNA.

By William Warren.

More than twenty years ago I took a pair of a *Bryophila* at Cambridge, which at the time seemed to me to present decided points of difference from *Glandifera*, but both Mr. F. Bond and the late G. R. Crotch, who saw them, referred them to that species as a variety, and I submitted to their decision. I have taken one or two at intervals since; but last year, having captured ten, quite fresh, and observing new points of difference, I sent a pair to Mr. Barrett, who forwarded them to Professor Zeller. The latter, at first, returned them as *Glandifera*, var. *Par*, but has since, Mr. Barrett informs me, agreed with him that they constitute a distinct species. I will therefore now proceed to give, as far as mere description can do it, the main points by which I think the two species may be differentiated.

1st. The lines and markings of *B. glandifera* are much more sharply and distinctly marked than in *B. Par*, which has, so to speak, a more mealy look.

2nd. Though the lines and markings of the two insects are exactly alike, *B. Par* has all the lines starting as *dark spots* on the costa, and a decided dark line at the base of the cilia of both wings, but especially the hinder ones.

3rd. *B. glandifera* retains its green tinge after death, which continues for years if excluded from light. *B. Par*, which, when fresh and alive, is of a much paler green, often with a beautiful pink tinge, fades directly it is killed, or when worn, to a dirty brick-colour.

4th. While *B. Par* has only, as far as I know, been taken, in this country, on old walls at Cambridge, *B. glandifera* is, I believe, a coast species.

Lastly, *B. glandifera* run slightly larger than the nearly allied species.

I may add that a form of *B. glandifera* occurs which has the mealy appearance of *B. Par*, but without the dark costal markings and base of cilia which are always observable in the latter.

These differences may appear but slight, but to any one who sees a row of the two insects, they will, I feel sure, appear sufficient to convince him of their real distinctness. I shall be much obliged to any one who will next summer send me full-fed larvæ of *B. glandifera* from the coast.

Park House, Stubbington, Fareham, Hants, Sept. 16, 1880.

NOTES ON THE LEPIDOPTERA OF NATAL.

By William D. Gooch, C.E.

I have read the article by Mr. A. J. Spiller, as published in the 'Entomologist' of this year, with much attention, as he describes a fauna which is very well known to me, and of which I have had an experience extending over five years; a field which, as he rightly says, has the merit of being very rich in species, many of them of great beauty and interest.

I feel obliged to express my regret, however, that Mr. Spiller, before addressing his paper to so important an organ in the scientific world as the 'Entomologist,' has not placed himself in communication directly with the great authority on all matters rhopalocerous in South Africa, the genial, enthusiastic, and careful Curator of the Cape Town Museum, Mr. Roland Trimen, F.L.S., &c. Had he done so, his paper would have been very much more complete, and "new species" perhaps might be found as already known, described, and appropriately placed, in the numerous papers published from time to time by the indefatigable author of 'Rhopalocera Africæ Australis.' Not that I disclaim any right to a discovery of new species by Mr. Spiller: my own experience proves that to an enterprising and active collector, as Mr. Spiller evidently is, from time to time new species are almost sure to occur, and such may have been Mr. Spiller's luck; but I am disposed to believe that had he consulted Colonel Bowker—who was in Natal, and who is the father of colonial collectors—he would have been told where most, if not all, of his "new species" had been collected by the "veteran" himself.

As is the case elsewhere, the occurrence of many species is wonderfully local, both in time and place of appearance; and unless the collector happens to drop upon the particular spot at the particular time, the insects may long remain unknown to him. The skippers—*Leucochitonea bicolor* and *L. paradisea*—are good evidences of this local habitat. I have only heard of them occurring at one spot, and there only for a very short period of the year. Again, on the coast of Natal, the occurrence of *Alæna Amazoula* is very local, and I believe, as is not uncommon, the insect is not developed freely in certain seasons. Mr. Spiller, in his description of its haunts, is very accurate, and describes practically three spots of a similar character to those which are known to me, where this curious and eccentric little butterfly occurs. Many others are equally liable to be overlooked from their close resemblance to insects of the same genus, or on account of their mimicking other species; a small insect, which Mr. Trimen, in his last series, has named after me, *Neptis* "*Goochii*," is a fair example of this, being very similar to *N. Melicerta* and *N. Saclava*, except that on the wing it appears smaller, and feebler in flight; the markings are so similar, till compared, that they might easily be rejected for the better-known insect. I met with it in several places and on several occasions, and feel sure that it is not rare, but has only been overlooked.

The mimetic tendencies of the *Danaidæ* and *Acræidæ*, or the tendency of other tribes to imitate them, are well known and well exemplified in the South African fauna, and this, especially for the first year or two of collecting experience in the Colony, causes a good many things to be overlooked. Mr. Trimen's very interesting and scientific Paper on the mimetic tendencies of South-African species, in Trans. Ent. Soc. Lond., vol. xxvi., well explains this. I think the mimetic tendencies of *Pseudacræa Boisduvalii* and *P. Tarquinia*—the former mimicking *Acræa Hypatia* or *Zetes*, and the latter *A. Aganice*—has led Mr. Spiller to overlook them on the wing. They both occur freely in the neighbourhood of Verulam,—Mr. Spiller's collecting neighbourhood,—but, being usually high flyers, have been probably passed over as *Acræidæ*, out of reach. This I surmise because Mr. Spiller does not make any mention of them in his notice. They are both very handsome and conspicuous insects.

I will now follow Mr. Spiller's remarks, amplifying them as far as I am able by my own personal observations.

PAPILIONIDÆ.

The *Papilionidæ* naturally claim our first attention. Of these the giant *Papilio Menestheus* (or *Ophidocephalus*) taking precedence, both from his beauty and size. I believe that the latter form (*Ophidocephalus*), like many other species, is only a derivative form of a West-African insect; and although I cannot assert it, I believe both the true *Menestheus* and the derived *Ophidocephalus* are present in the Colony. From Mr. Spiller's experience he seems to have been unlucky in meeting with this prize. I have, however, taken it on the wing near Verulam, and also freely in the big "Bush" he speaks of as producing leopards. I know the bush well, but never saw the leopards, and never carried a brace of revolvers. At the summit of a long ridge, in the middle of this bush and not very accessible, was a long open glade where the undergrowth of thorny climbers (asparagus, &c.) were not quite so abundant as in the lower glades. Here I made a collecting station, spending many days from noon to two o'clock in watching the denizens of the bush and taking what seemed worth the while. And here was the first attempt I made to capture *Ophidocephalus*. Like most Papilios, he is a great traveller, coursing along at twenty miles an hour, just below the highest boughs of the open trees, perhaps twenty feet high, and out of reach; but I noticed that there were two spots where he had to dip under lower branches in consequence of the glade narrowing, and here came within jumping distance of my seven-foot net. My first attempt led to ruthless destruction of my net, for, having taken up a position, I struck swiftly and with right good will at the next specimen which came past. He escaped with a dive, but my net and nearly myself were inextricably impaled on a thousand thorns of a festoon of liana. It cost me half-an-hour to clear away the wreck, and meanwhile, as if in spite, whilst thus helpless, specimen after specimen dived at me in an interrogative way and "passed on, on the other side." By the time I was at last free I had learnt that, if I cleared the thorny plants away and got my net in order, I should certainly have fine fun in getting my noble friend. Having rearranged my net, I repaired next day with a bill-hook and a boy to the scene of action, and chopped away everything that prevented a fair sweep; even then I found that it was much "easier said than done"; his double was so quick that after an hour and a half of steady work, in which I had a chance every seven minutes on an average, I only caught one yellow used-up old male, who could not "dodge" so actively as the others, as he had lost the whole of his tails and most of his hind wings. A little more experience in the course of the week secured several perfect specimens, male and female. But I certainly had harder physical work in catching them than I could have ever believed a butterfly would have yielded. Catching bats in the twilight under Banana plants was easy in comparison. Although I caught this half-dozen or more, I did not notice any great diminution in the number of specimens. So I imagine they were fairly plentiful, and, having enough for my cabinet, I left the others to afford future sport, which they always did in fine weather during the summer. Several of my non-entomological friends looking upon butterfly catching as not a very athletic sport, I took them up to "catch" *Ophidocephalus*, and their efforts and want of success established the pursuit upon a more honourable basis in their minds from that time forth. In this bush glade *Papilio Merope* also occurred abundantly. He dodged about sharply over the thick rank grass of the undergrowth, but was very easy to secure, and used to become a ready victim to my friends when they had utterly failed in catching *Ophidocephalus ?* (*P. Menestheus*). Mr. Spiller mentions *P. Cenea*, apparently not understanding that it is the accredited female of *P. Merope*, mimicking *Danais Echeria*. There are also an ochre and a red var. of the female of *P. Merope*, which are occasionally to be met with. Decaying guavas or oranges under the trees were great attractions for them.

The transformations of neither of these insects are known*; the larva of *Ophidocephalus* would be a great "find," and should be very large. Like *Apatura Iris*, it may feed on the topmost branches of some of the bush trees. I have never seen an *Ophidocephalus* hover as if depositing its eggs, although I have often watched them, to discover, if possible, where I might look for the larva with success.

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* There are two important papers on *P. Merope*, by J. P. Mansel Weale and Roland Trimen, in Trans. Ent. Soc. Lond., 1874; and Mr. Gooch will find its transformations figured and described by the former.—W. F. K.

The two common insects *P. Demoleus* and *P. Nireus* are very abundant, and they may soon be bred by searching the orange-trees for the larvæ, which are fairly abundant in both cases if you happen to hit on a favourite breeding place.

P. Merope, according to Dr. Seaman, who first called my attention to it, is more strongly and deeply barred at one season than the other, the dry weather of winter making lighter imagos than those bred and developed through the hot damp summer. As Mr. Spiller remarks, many of the *Anthocharinæ* are similarly affected, notably the vars. *A. Keiskamma* and *Evarne*, as also several other common species.

The question of the mimicry of the *Danaidæ* by the female *P. Merope* has been fully dealt with by Mr. Trimen in several papers.

Next in order come *P. Antheus* and *P. Policenes*, very closely allied; the former so rare as to have been sometimes considered almost doubtful; the latter common enough, especially immediately after the early rains and the first heats of summer—in November and December, when, as Mr. Spiller says, they can be taken freely, sipping the moisture from damp mud on the margins of rain-pools in the sandy paths near bush, all along the coast; but they become more rare as you reach the higher ground inland. The transparent greenish tint of *P. Policenes*, with its black bars and long delicate tails, make it a very pleasant insect to take and very difficult to get perfect without spoiling the tails. In the summer of 1878—79 the larvæ and imagines of this insect, as well as those of *P. Pylades* and *P. Leonidas*, were collected in considerable numbers at Durban by Colonel Bowker and by Mr. Philip Payne. They occurred on the young shoots from roots of trees that had been cut down in clearing out the bush to make the park near Durban. The transformations were carefully noted, and specimens sent down to Mr. Trimen for description, soon to be forthcoming. The larva of *P. Antheus* must certainly be rare, and is, so far, unknown. That of *P. Leonidas* had already been worked out by Dr. Seaman, of Pine Town, and by myself on the coast. The protective form and colouring of the pupæ and larvæ of all these insects is most perfect. *P. Leonidas* himself is a very handsome butterfly, and both sexes resemble *Danais Echeria* to a certain extent, being lazy on the wing, except when startled; they may not unfrequently be passed over on that account. *P. Pylades*, of which two very well-marked vars. occur in Natal, is a very handsome butterfly; one var. is nearly identical with the West-African form; the other is considerably divergent both in markings and tint of colouring. It is accustomed to haunt special spots near the food-plant, and generally requires a long net and a jump to get at it. The larva was discovered in 1878—79 at Durban, as before-mentioned, and very many perfect specimens bred from them; but I am not aware whether both varieties occurred, or to what extent if they did so.

Mr. Spiller mentions *P. Zenobius* as amongst his captures; before accepting the record, I should be glad to hear that it has been examined by Mr. Trimen, and reported "the real thing"; and if not, I hope Mr. Spiller will send the specimen to the Cape by a safe hand, to be verified. Till now, *P. Zenobius* has been considered very doubtful.

Three more *Papilios* not mentioned by Mr. Spiller are, *P. Hippocöon*,* *P. Euphranor*, and *P. Echerioides*. They occur in the wooded kloofs of the higher districts of Natal, and are not uncommon. Colonel Bowker has worked out the transformations of one of these, but I am not quite sure which. Two of them are reputed female and male forms: one, the female, tailless; the other, male, tailed and allied to *P. Merope* and his ladies in this respect. I have never had an opportunity to work out the life-history of these insects.

(To be continued.)

IDENTIFYING *ACRONYCTA TRIDENS* AND *A. PSI.*

By the Rev. G. A. Smallwood.

All lepidopterists recognise the difficulty of distinguishing these two insects in the imago state, but many give up the task as hopeless. Even so eminent an entomologist as Mr. Stainton declares in his 'Manual' that the moths cannot be separated, though he has no doubt as to their being distinct species. I am not going to make so rash an assertion as that the moths in question can be certainly distinguished, but I should like to draw attention to some points of difference which may assist collectors in naming the "daggers" correctly, and at the same time to draw forth similar remarks from other observers.

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* This insect is regarded as one of the female forms of *P. Merope*.—W. F. K.

I have in my cabinet a series of ten *Acronycta tridens* and twelve *A. psi*, every one of which has been bred by myself from the larva, and most carefully kept separate and labelled. I can therefore say positively that the insects are rightly named, as thereis no difficulty in distinguishing the larvæ.

1. What strikes me on the first glance at the two series, side by side, is that *Acronycta tridens*, as compared with *A. psi*, is the smaller and darker of the two. Newman, I am aware, says that *A. tridens* is no darker than *A. psi;* but with due respect to his authority I maintain that the difference of shade is distinct.

2. Looking more closely at the insects I find that there is also a difference in the general colour of the fore wing. In *A. psi* it is pure grey, varying in shade, of course, in different specimens, some being dark grey, others paler; but the grey is pure in all, that is, a mixture of black and white only; whereas in *A. tridens* a third colour, ochreous-brown, is added, so that the general colour is warmer, and of a brown-grey hue. In *A. psi* there are parts of the fore wing (as the inner part of the subterminal line) which are often pure white. In *A. tridens* even the whitest parts are suffused with ochreous, and there is no part pure white.

3. With regard to the markings. All the markings of the fore wing in *A. psi* are more abrupt and defined than in *A. tridens*, whereas in *A. tridens* the markings are blended with the ground colour by the soft brown tint which suffuses the whole wing.

4. There are one or two marks which call for attention in particular. With reference to the †-like mark at the anal angle, this mark is somewhat different in the two species. In both it consists of a longitudinal black dash crossing a diagonal curved black line. Now in *A. psi* the curved line is darker and heavier than in *A. tridens*. Moreover, the longitudinal dash is shorter in *A. tridens* than in *A. psi*. In *A. psi* this straight black dash extends from the fringe through the subterminal line and beyond towards the base; but in *A. tridens* it scarcely passes the subterminal line.

5. The scales on the head and palpi in *Acronycta tridens* are

brown; in *A. psi* grey, or nearly white. This last is, I think, a very tangible point of difference.

6. The hind wing of *A. tridens* presents an obvious sexual difference which I have not hitherto seen noticed. In the female *A. tridens* and in *A. psi*, of both sexes, the hind wing is more or less shaded darker, especially toward the hind margin; but in the male *A. tridens* the whole of the hind wing is pure shining white, and on the white ground the black dots on the hind margin stand out clearly. Not even on the veins is there any dark shading whatever.

I may add that in observing this sexual difference in *A. tridens* I was guided by opening the bodies to prevent grease, putting those down as males which contained no eggs.

The foregoing remarks are offered with the hope of eliciting the observations of other entomologists who may possess specimens of the two species which have been bred by themselves, and as to the correct naming of which there can be no doubt.

Holy Trinity Vicarage, Ashby-de-la-Zouch, Sept. 14, 1880.

THE LARVA OF *PACHETRA LEUCOPHÆA.*

By George Elisha.

Of this hitherto unknown larva I succeeded in rearing three from the egg to the pupa state. Unfortunately they did not emerge, through, I am now convinced, keeping them too dry; in fact, taking too much care of them. I think if they had been left out in the weather they would have done better; however, a few facts concerning them may be interesting, and possibly of use to others, to enable them to arrive at a more satisfactory result.

The eggs from the captured female of *P. leucophæa*, mentioned in the 'Entomologist' (vol. xii., p. 205), hatched in about three weeks; the larvæ escaped by gnawing a hole through the side of the egg, and when first hatched were of a light greenish grey colour, and extremely active. Being in doubt as to what kind of grass they fed on, I went specially to Box Hill and cut out some turfs of grass of nearly every sort I could see, and placed them side by side, so as to make a compact sod of grass in the cage. The larvæ soon crawled out of the pill-box on to the grass, and kept wandering about without the least inclination to settle down. On looking at them the following morning they were still crawling backwards and forwards over each other in the corner of the cage, and doing anything but eating. I thought there must surely be some mistake in the food, and went at once to Woodford and dug up a number of small roots of various wild plants, and put them in the cage, but all to no purpose; the following day they were still crawling about, and some were hanging in the web at the edge of the cage dead. I again went to Box Hill, and dug out some tufts of grass and several plants from about the ground by the tree on which the moths were taken. On arriving home I put all I had gathered into the cage, and again, on looking at them the following morning, I had the satisfaction to find several larvæ were feeding on one of the grasses I had brought home last, viz., *Poa nemoralis*. Afterwards I found they would as readily eat *P. annua*, which latter being obtainable nearly everywhere, I had no further trouble about their food.

I was looking at them one morning at the end of the first week, watching them feeding, when, to my great surprise, an ant crawled up a blade of grass with a dead larva in its mouth, an achievement for which he very soon paid the penalty of death. I immediately procured a fresh sod of grass, and removed everything from the cage, put in the fresh grass, and carefully shook and searched all the grass and plants that had been in the cage. I found and killed about a dozen ants, which I must have brought home with the grass roots; but they had made short work of my small larvæ, for, after most careful searching, I could only find twenty-nine. Probably many had died before I hit on the right food. Those remaining gradually decreased one or two at a time during the winter, till after hybernation I had only seven remaining, and of these four more died, about one each week, till only three reached the pupa state. Watching them at this time once or twice a day, I removed the dead ones immediately, and have three of these larvæ nicely preserved.

After the first moult the colour is dark greyish green, with three distinct whitish lines along the body, head yellowish grey, spiracles black, with a few slight hairs. At this period of their life they were generally stretched at full length on a blade of grass when at rest, but as they get older they hide during the day among the roots, and come out at night to feed.

Just previous to hybernation the larva is about one inch and a quarter long, moderately plump, tapering towards each end; head dark shining brown, with black spot each side of mouth; body smooth, dark greyish brown, others light brown, dorsal and subdorsal line very conspicuous and whitish; on each segment are four very distinct linear-shaped black marks, one on each side and close to dorsal line, and one on each subdorsal line. Above the spiracular line is a broad stripe of a much darker shade; spiracles black, with slight hairs; and legs light brown. The distinguishing character in these larvæ is the very conspicuous dorsal and subdorsal whitish lines, and the four rows of linear-shaped black marks, which remain from the first moult to the final change.

After hybernation the larvæ feed rather voraciously, and now become of a dark dingy brown colour, and all the lines and markings that were so very plain before are now scarcely discernible. At the beginning of April they spin a slight cocoon mixed with earth on the surface of the ground, close to a root of grass, and change to a dark brown pupa.

122, Shepherdess Walk, City Road, Sept. 18, 1880.

THE TORTRICES OF SURREY, KENT, AND SUSSEX.

By Walter P. Weston.

(Continued from p. 161.)

Endopisa nigricana, Steph. =*pisana*, Guen., Doub. =*nebritana*, Doub.—The imago is not uncommon, and sometimes very abundant, in hedges adjoining the fields where peas were grown the previous year; and is also to be met with in woods among *Orobus niger* and other vetches. The larva feeds in the pea-pod in July and August.

Stigmonota coniferana, Ratz.—This species, while not uncommon in Scotland, is rare and local in these counties. The imago appears in May and June among Scotch firs, and has been reared from larva feeding on the bark of these trees. It has occurred at Esher and Weybridge.

S. Leplastriana, Curt.—This insect appears restricted to the south-east corner of Kent, where in some seasons it is not uncommon. The imago flies freely in the sunshine in July and

August among sea cabbage (*Brassica oleracea*), in the stems of which the larva feeds.

S. perlepidana, Haw.—Local, but not uncommon where it occurs. The imago appears in May, and flies freely in the afternoon sunshine. The larva feeds on *Orobus tuberosus* and *O. niger*. The species occurs at Darenth; near Strood; at Folkestone; Tilgate Forest, Hastings; and Mr. C. G. Barrett has recorded it as being very common at Haslemere.

S. internana, Guen.—Local. The imago is to be met with in May and June flying among furze bushes, and has occurred near Darenth and Tunbridge Wells; near Guildford, Epsom; and Brighton.

S. composana, Fabr.—This species is double-brooded, the imago appearing in May and again in August, and is common throughout, among different species of clover. The imago flies freely on warm sunny days, and the white under wings of the male render it conspicuous; the female is more readily to be obtained by sweeping the clover heads.

S. flexana, Zell. = *Weirana*, Doug.—Not uncommon among beeches. The imago flies in June, and is to be met with more plentifully in the early morning by sweeping the tips of the boughs. The larva is said to feed between united beech leaves in August and September, and to pupate in a small whitish cocoon in similar situations. It has occurred at Mickleham, Tilgate Forest, near Hastings, &c.

S. nitidana, Fab. = *redimitana*, Guen.—The habits of this species closely resemble those of the preceding, except that it frequents the oak instead of the beech. It is also smaller, commoner, and more generally distributed. The imago appears in June; the larvæ feed between united oak leaves, and the pupæ are to be found enclosed in small neat cocoons between dead leaves in autumn and winter.

S. Trauniana, Schiff.—Scarce and local. The imago appears in July amongst maple (*Acer campestre*), and its capture has been recorded from Plumstead and near Bexley. It has also occurred at Croydon.

S. regiana, Zell.—Generally distributed. The imago appears in June and July among sycamores (*Acer pseudo-platanus*), and is usually to be met with in plenty on walls and palings near these trees. The larva feeds under the bark, and the pupa, enclosed in a neat white cocoon, is to be found in the same situation.

S. puncticostana, Steph.—Rare and local. It occurs in woods in June and July, and has been captured at Darenth, near Strood, Folkestone; Croydon, West Wickham, Haslemere; Tilgate Forest, and near Lewes.

S. roseticolana, Zell. = *Germarana*, Wilk. non Hub.—Distributed throughout among wild rose, the larva feeding in the hips. The imago appears in June and July, occurring at Darenth, Coombe, near Strood, Folkestone; Richmond, West Wickham, Haslemere; near Lewes and Hastings.

Dicrorampha alpinana, Treit.—Local. The imago appears on the wing in July, and flies freely at dusk, but generally about six feet from the ground. The larva feeds on tansy (*Tanacetum vulgare*). The localities are Charlton, Darenth, Strood; Croydon, Mickleham, Godstone, Haslemere.

D. politana, Hub.—Rather local, but abundant wherever it occurs. The imago appears in June among yarrow (*Achillea millefolium*), and is common on most railway slopes near London, and is also distributed throughout these counties. It flies during the hot sunshine, and also at dusk.

D. Petiverella, Linn.—Abundant everywhere among yarrow. The imago appears in June and July, and its habits are similar to those of the preceding species. The larva feeds in autumn in the roots of yarrow.

D. flavidorsana, Knaggs. — Must be considered as only a variety of *D. Petiverella*.

D. sequana, Hub.—Local, but common where it occurs. The imago appears towards the end of May, flying amongst the ox-eye daisy (*Chrysanthemum leucanthemum*), and is not uncommon near London. It occurs also at Darenth, Folkestone; Croydon, Epsom, Box Hill, Haslemere; Lewes, Hastings, and Eastbourne.

D. plumbana, Scop. = *ulicana*, Gn., Wilk.—Abundant everywhere among the ox-eye daisy. The imago appears in May and June, and there appears to be a second and less common brood in July and August.

D. plumbagana, Treit.—Less common than the preceeding species, but generally distributed. The imago appears in May and June among the ox-eye daisy, and is very partial to railway slopes and similar situations.

D. acuminatana, Zell.—This species is nearly, if not quite, restricted to chalky districts. The imago appears in May, and more plentifully again in August and September. Localities are Folkestone, Darenth; Caterham, Mickleham, Box Hill; Lewes, and Brighton.

D. simpliciana, Haw.—Not uncommon wherever its food-plant, mugwort (*Artemisia vulgaris*), occurs, in the roots of which the larva feeds, remaining therein through the winter, and changing to a pupa in the early spring. The roots should be collected in March and April. The imago appears in June, and has occurred at Greenhithe, Charlton, Plumstead, Northfleet, Dover, Margate, Folkestone; Croydon; and Brighton.

D. consortana, Steph.—Local and not common. The imago appears in July and August among ox-eye daisy, in the shoots of which the larva feeds. It has occurred at Charlton, Margate, Dover, Folkestone; Mickleham, Croydon; and Lewes.

Before leaving this group I must refer my reader to the excellent paper of Mr. C. G. Barrett (E. M. M., vol. ix., p. 25, *et seq.*) on the distinguishing characteristics of the imagos of the various species, most of which are by no means easy to distinguish, and with worn or faded specimens the task is entirely hopeless.

(To be continued.)

ENTOMOLOGICAL NOTES, CAPTURES, &c.

The Lepidoptera of the Shetland Isles.—Mr. Meek's collector has returned from Shetland with a remarkably fine lot of the Lepidoptera of those islands. In the next two numbers of the 'Entomologist' it is intended to describe the remarkable forms which occur in Shetland, and also to figure the more striking varieties in two coloured plates.—John T. Carrington.

Apatura Iris and Vanessa Antiopa near Battle.—On August 1st, a fine male specimen of *Apatura Iris* flew across the lawn here. When I first saw it, it was very near the ground, but was soon out of my reach. On the following Sunday, August 8th, I succeeded in capturing a female of the same species near the same spot; she was very much worn. On Friday, the 27th, I saw a beautiful specimen of *Vanessa Antiopa* in this park. I pursued it for some distance, but it flew over a very high hedge and made its escape.—Thomas Howe; Normanhurst Court, Battle, Sussex, September 5, 1880.

Vanessa Antiopa at Cambridge.—I received a fine specimen of *Vanessa Antiopa* on August 19th, which had been taken about a mile out of Cambridge on the preceding afternoon, close to an apple orchard by the side of the river.—A. E. Hunter; Beechville, Tunbridge Wells, September 7, 1880.

Vanessa Antiopa in Essex.—On August 31st I captured a fair specimen of *Vanessa Antiopa*, flying round an apple tree, which I had sugared, in our garden.—W. G. Nash; Clavering Vicarage, Newport, Essex.

Vanessa Antiopa at Tooting Common.—On September 2nd my brother, while walking on Tooting Common, had the good fortune to capture a fine specimen of *Vanessa Antiopa*. The insect settled on some old sugar marks on an elm tree, and, having his net with him, my brother was enabled to take it easily.—James Tearse; 14, Ducie Street, Clapham.

Vanessa Antiopa near Camberwell.—On Sunday morning, August 29th, whilst taking a stroll about 10.30 a.m., I observed a *Vanessa Antiopa* flying about a baker's shop in the Brixton Road. After making several ineffectual attempts to secure it, and once getting it under my hat, it escaped, and I did not then see it, though I waited about twenty minutes. I returned, however, with my net a quarter of an hour later; and after waiting another ten minutes, it again made its appearance, and I secured it.—Paul J. Lowrey; 61, Hackford Road, North Brixton, S.W., September 11, 1880.

Vanessa Antiopa at Malvern.—A rather worn specimen of this rare butterfly was taken this season in a garden, flying over China-asters, by a friend of mine, who has kindly given it to me. This is the second example taken in Malvern, both of which are in my collection.—W. Edwards; Abbey Terrace, Great Malvern, Sept. 20, 1880.

Vanessa Antiopa at Henley.—A specimen of *Vanessa Antiopa* was captured at Henley-on-Thames, Oxon, by James Wilkins, on September 3rd, 1880.—W. Holland; 71, Bedford Street, Reading, September 20, 1880.

VANESSA ANTIOPA NEAR PONDER'S END.—I beg to record the capture of a splendid large specimen of *Vanessa Antiopa* on August 22nd last. It was taken in a hat, while at rest on a bed of nettles, by a person who was out fishing. The captor also saw another example on the same day. This beautiful insect was exhibited at the East London Entomological Society on September 8th, and has since been added to the collection of Mr. John T. Carrington.—D. PRATT; 398, Mile End Road, London, E., September 20, 1880.

VANESSA ANTIOPA IN NORFOLK.—A fine specimen of *Vanessa Antiopa* was taken near Aylsham, at the end of August, by Mr. George H. Asker; and another (I think it could have been no other butterfly) was seen by two of my friends on Mousehold, close to Norwich. They described it as "a curious butterfly, quite black," which they had seen flying about. This was on September 2nd.—JOHN B. BRIDGMAN.

LYCÆNA BŒTICA NEAR BOGNOR.—On September 12th, while at Aldwick, near Bognor, Sussex, I went into the garden shortly after breakfast. I almost immediately saw a specimen of this rare butterfly at rest on a geranium. Having obtained my net I succeeded in taking it.—HERBERT EDWARD DURHAM; 82, Brook Street, Grosvenor Square, W., September 21, 1880.

VARIETY OF LYCÆNA CORYDON.—While on a visit to Folkestone, last August, I took a female *Lycæna Corydon* in perfect condition, in which a beautiful fawn-colour, or more correctly pale cinereous, replaces the usual very dark brown ground colour.—H. HODGE; 33, Almorah Road, Islington, N., September 15, 1880.

HERMAPHRODITE LYCÆNA ALEXIS.—I captured near this place, on August 21st, an hermaphrodite *L. Alexis.* It was rather worn. —G. T. DEWEY; 11, Tideswell Road, Eastbourne, Sussex, September 18, 1880.

CATOCALA FRAXINI NEAR BARNSLEY. — On September 6th I captured a perfect specimen of *Catocala fraxini* at sugar in my own garden. — W. WHITE; Darton House, Barnsley, Yorks., Sept. 21, 1880.

CATOCALA FRAXINI NEAR ABERDEEN.—On the 30th August, and two nights after, a specimen of *C. fraxini* was seen at sugar on the same tree, and just as my friend was about to capture him he went off. I tried again myself, but have failed in seeing it. I have been successful in capturing some larvæ from the same tree, but cannot tell as yet what they are. In the north here we have to wait patiently to see what a rare larva turns out, for no one seems to know anything about them. Do you think they are those of *C. fraxini*? In the months of July and August sugaring was of no use here; but I am now taking over fifty moths each night since the 4th September. — JOHN MUNDIE; Aberdeen, September 14, 1880.

[The larvæ found by Mr. Mundie are not probably those of *C. fraxini*, which is said to be full-fed in July. Our correspondent will find a good description of the larva of this species at p. 464 of Newman's 'British Moths.'—J. T. C.]

CATOCALA FRAXINI NEAR BRISTOL.—I captured at sugar in Leigh Woods, near Bristol, on September 1st, a specimen of *Catocala fraxini*. It is unfortunately in bad condition, much worn and broken. I was accompanied by a friend, Mr. H. A. Smith; and Mr. J. W. Clarke, of Park Place, Clifton, saw the insect soon after capture.—G. C. GRIFFITHS; 8, Cotham Side, Cotham, Bristol, September 7, 1880.

DEILEPHILA LIVORNICA AT KINGSLAND. — At midday on the 15th September my father had the good fortune to take a specimen of this rare hawk-moth at rest on the pavement in Mansfield Street. It had been evidently lured by the light of the neighbouring shops. Unfortunately it had damaged itself a little. It is now in the collection of Mr. J. A. Clark, of Hackney.—W. J. HARPER; 66, Mansfield Street, Kingsland Road, September 18, 1880.

DEIOPEIA PULCHELLA.—I took a fine specimen of this moth, flying over a fallow field close to the sea, at Rottingdean, on the morning of Tuesday, September 7th.—R. H. TITHERINGTON; Stanley House, Rottingdean, September 11, 1880.

DEIOPEIA PULCHELLA AT DOVER.—I captured a fine female *Deiopeia pulchella* near Dover, on Sunday, September 12th.—W. J. AUSTEN; Radnor Street, Folkestone.

LITHOSIA QUADRA NEAR FOLKESTONE.—I was much surprised to find a female specimen of *Lithosia quadra* one morning this last summer while walking between Folkestone and Sandgate. Mr. Blackall, of the former town, tells me he also took a single specimen some years ago in the same neighbourhood.—J. R. WELLMAN; 219, Elm Park, Brixton Rise, S.W., Sept. 6, 1880.

Stauropus fagi.—In the autumn of 1879, while out beating for lepidopterous larvæ, I took four of that of *S. fagi*, from which I reared four fine imagines in May of this year. I have again this autumn taken three more larvæ of this species, and hope in due course to have the same good fortune in rearing the perfect insect, these larvæ having gone to pupæ.—D. Pratt; 398, Mile End Road, London, E., September, 1880.

Successful breeding of Xylina furcifera (conformis).—Last April a friend kindly sent me twenty eggs of this rare Noctua from Glamorganshire. They all hatched April 18th to 19th, almost before its food-plant, alder, was in leaf; in fact could only find half-opened buds. The young larvæ took kindly to them, and fed up freely and well during May. Nineteen went to pupæ by the first week in June. I avoided touching the larvæ when changing them, and always had fresh and clean moss for them to hide away in during the day, for they only fed at night. Two imagines appeared in my breeding cage July 31st, and others at intervals during August, up to September 1st, when the last moth appeared: in all eighteen magnificent specimens.—W. H. Tugwell; 3, Lewisham Road, Greenwich.

Acronycta alni.—A larva of this rare moth was found in Felbrigg Park, near Cromer, on August 31st, feeding on the rhododendron.—W. J. Hay; 13, Park Road, Haverstock Hill, N.W., September 9, 1880.

Micra ostrina.—On September 8th I was fortunate enough to take a fine *M. ostrina* on Dover Cliffs. I was nearly passing it over as a *Crambus*, which it much resembles in its flight. I took it about eleven o'clock in bright sunshine. My capture confirms an old note I have from Mr. Bond, that this insect is double-brooded, though I understand from the Rev. H. Burney that nearly all of the captures known have occurred in June or July. — Battershell Gill, M.D.; Folkestone, September 23, 1880.

Oporabia autumnata at Dutton.—On Saturday and Sunday night I went over from here to try what my lamps would do. There were a few *Hydrœcia micacea*, *Nonagria fulva*, &c.; but I was amply repaid by getting one female and one male of *Oporabia autumnata*. It is now thirty years since I last took it, and then at Barron Wood, near Carlisle. At that time the Wood was open to entomologists, and the best locality in Cumberland. What with its destruction by the Midland Railway, and that curse to entomologists, game preservation, what is left of it might as well have been swept away entirely.—J. B. HODGKINSON; 15, Spring Bank, Preston, September 13, 1880.

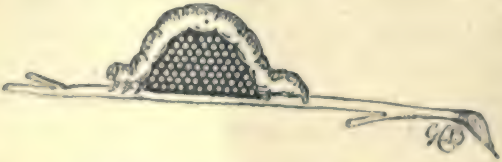
CABERA ROTUNDARIA AT DUTTON.—When collecting larvæ last September (1879) at the above place, by beating alder, I beat seven specimens of *Cabera rotundaria;* some of them very strongly marked. Plenty of *C. pusaria* put in an appearance. Whether *C. rotundaria* is a variety, or not, I cannot say. Whether or not it is worthy of a name.—ID.

LIPARIS CHRYSORRHŒA AND CLEORA VIDUARIA IN THE NEW FOREST: CORRECTION OF ERROR.—In reply to Mr. Jenner Weir's remarks (Entom. xiii. 207), I may say he is quite correct in both his queries. When I took the pupæ I judged, from the dark colour of the cocoon, that they were *Liparis chrysorrhœa;* but when the moths emerged they proved to be *L. auriflua.* In reference to *Cleora viduaria*, the insect I took was a very late and peculiarly marked specimen of *Tephrosia extersaria*, the white blotch being scarcely apparent, and was pronounced to be in all probability *C. viduaria* by two persons I met collecting. On my arrival home I omitted to look at it more carefully, hence my error. I may also add to my captures, already enumerated, *Zygæna meliloti.*—PAUL J. LOWREY; 61, Hackford Road, North Brixton, S.W., September 11, 1880.

LARVA OF SMERINTHUS POPULI.—A handsome variety of what I believe to be this larva, not described in Stainton's 'Manual' or in Newman's 'History of British Moths,' was found by me on September 1st at Palmerston Park, near Dublin. The larva is ornamented on each side with a double row of ten reddish brown spots. The first five upper spots, counting from the head, are small; 6, 7, 8, large; 9, small; 10, large. The ten lower spots are all much the same size, *i.e.* a little smaller than the large spots of the upper series. When the larva was found the spots were of a brighter (almost marone) colour than they are at present, but they have become duller as the pupa state is fast approaching. The red spot that is always found underneath the horn is present; also a red spot at the bottom of the horn on the upper side, and another at the top of the head. It has just occurred to me that this larva might perhaps be the child of *S. populi* and *S. ocellatus*; but I should imagine it very improbable that an alliance between the two species would take place in a state of nature. Since writing the above I have seen the description and figure of a larva very similar to mine in Mr. Wilson's 'Larvæ of British Lepidoptera.'—W. W. FLEMYNG; 18, Upper Fitzwilliam Street, Dublin, September 16, 1880.

ELACHISTA CERUSSELLA.—In the early part of August I collected a quantity of the larvæ of this species, which make conspicuous blotches in the leaves of the reed. There are sometimes two, and occasionally three, in a leaf. The egg is deposited near the tip of the leaf, and the larvæ mine downwards. Out of sixty-one larvæ collected only two escaped the devouring ravages of the Ichneumons; and this is no exception to the rule, having on many previous occasions collected an equal number with a similar result.—WILLIAM MACHIN; 22, Argyle Road, Carlton Square, E., Sept. 10, 1880.

CURIOUS HABIT OF LARVÆ OF THE GENUS BOARMIA.—On June 14th last I received from Mr. G. F. Mathew a larva of *Boarmia repandata*, as figured; and I cannot do better than quote a portion of his letter:—"I found this larva seated on a twig brooding over the batch of ichneumon cocoons; whether he will move during his journey to you I cannot say, but I carried him many miles in my pocket the day before yesterday and he never budged." When it arrived it was still in the same position, and remained so until I removed it, for preserving, four days afterwards. The imagos, about seventy in number, appeared on June 26th. The cocoons beneath the larva are shown as they appeared after the escape of the fly. On August 19th, at 3.30 p.m., while searching for larvæ at Stoke, I saw on a privet bush a moving mass of small larvæ emerging from a larva of *Boarmia rhomboidaria*. I removed the twig, carried it carefully



home, and placed it in a similar position in which I found it, to watch its progress. The larvæ emerged independently (each making a small aperture) from both sides of the caterpillar, which was resting at full length on the upper side, and at once began making a web around the twig and in every direction, apparently without the slightest order; this continued for about three hours before I could detect whether they were going to make a round mass or the usual semi-pyramid of cocoons. From that time it began to get into the final shape, and was completed, to all external appearance, in about seven hours, the mass forming under the twig; the victim by that time had twisted itself half round, apparently trying to protect its destroyers. By the next morning it had taken up a position over the cocoons similar to that figured above. From these observations it will be seen that the caterpillar voluntarily covers them. I am at a loss to conjecture any reason for this, seeing that the larvæ themselves had securely fastened the mass of pupæ to the twig. Ninety-five imagos emerged this morning, which are certainly *Microplitis alvearia*, Fabr., and very distinct from those bred from the *B. repandata.*—G. C. Bignell; Stonehouse, Plymouth, September 3, 1880.

[The ichneumon which attacked the *Boarmia repandata* is a species of the genus *Microplitis*, with the head, thorax and abdomen black, all the legs yellowish, except hind coxæ, which are black, but pale just at apex. Such a species is not described by Haliday in 'Entomological Magazine' (vol. ii.).—Ed.]

Parasites of Abraxas grossulariata.—On the afternoon of May 30th, while standing in a garden at Laira, my attention was directed to a small ichneumon flitting about from leaf to leaf, keeping its antennæ in constant motion, evidently hunting about for a victim in which to perpetuate her race. After waiting and watching some time she came up to the object of her search, which was a larva of *Abraxas grossulariata.* After passing round it several times, apparently to make sure everything was correct, she suddenly sprang on the unfortunate larva, and thrust her ovipositor into the 2nd segment just below the dorsal line; the larva, during the operation, twisted itself from side to side to get rid of the foe. The ichneumon, *Mesochorus olerum*, Curt., then alighted on a leaf close by, and very carefully wiped her ovipositor. I then boxed my lady, and waited to see what the larva would do.

This soon began to move from the leaf, descended the branch, and eventually tried to hide between the stem and the wall (to which the tree was fastened). Seeing it did not intend to make a further start I boxed it, brought it home, and fed it with much care, thinking I should know something of the life-history of *M. olerum*. The larva of the ichneumon became a pupa on June 14th, and the imago appeared on the 29th; but to my surprise out came *Casinaria vidua*, Grav. No doubt that *M. olerum*, who is a hyper-parasite, having found that the *A. grossulariata* was infested with the larva of a *Casinaria*, tried to deposit her egg in the *Casinaria* larva, but by some mishap it did not reach the intended destination. I have bred several *Casinaria vidua* this season from *A. grossulariata*, and two *Mesochorus fulgurans*, Hal. This is a hyper-parasitic species, and I do not think there can be the slightest doubt but that it was a parasite of *C. vidua*. I have arrived at this conclusion from the fact that they came out of *C. vidua* pupæ, and thereby showing that *M. fulgurans* did not complete the entire destruction of *C. vidua* until it had spun its cocoon, which is of an oval shape, and has the appearance of coarse brown paper, the apices brown, followed by a blackish zone; the centre portion, which occupies one-third, is brown. I also bred *Mesochorus sericans*, Curt., which is hyper-parasitic on the larva of the *Tachinidæ*, and, like the above-named species, does not consume its victim until after it has changed into pupa; therefore there cannot be any doubt but that it is hyper-parasitic. I have bred one *Ichneumon trilineatus*, Gmel., to-day; this, after true Ichneumon fashion, did not form a cocoon itself, but emerged from the pupa of *A. grossulariata*. From these larvæ I also bred several dipterous parasites belonging to the *Tachinidæ;* these, Mr. Meade tells me, are all specimens of the variable and common *Exorista vulgaris*, Fall. Last year I bred an undetermined species of *Mesochorus* and an *Apanteles;* the former, without doubt, is hyper-parasitic on the latter, as it emerged from an *Apanteles* cocoon. I have again bred both this year from *Vanessa cardui*. —G. C. Bignell; Stonehouse, Plymouth, August 14, 1880.

Harvest-men (Trombidium Phalangii). — In a back number of a Natural History Monthly there is an extract from Gosse's 'Tenby,' which refers to "those long-legged cousins of the spiders that are familiarly called harvest-men." Are these creatures really not spiders; and if not, what are they? The long-legged spiders are unusually abundant here this season.—W. Macmillan; Castle Cary, Somerset, August 19, 1880.

[The "long-legged spiders" of our correspondent, as Gosse says, really belong to a younger branch of the spider family, but their hereditary characteristics are better preserved in the harvest-men than in their nearer relations. The Arachnids are divided into three great divisions, which may conveniently be called spiders (*Araneina*), scorpions (*Pedipalpi*), and mites (*Acarina*). The family of the *Phalangiidæ* includes these "long-legged cousins of the spiders," and this belongs to the *Pedipalpi*. Their short, but thick, sessile abdomen is distinctly divided into segments, and their maxillary palpi are abnormally developed, both showing their true pedipalp character. The claws of the scorpions are merely a further development of the maxillæ, and this tendency is well shown in our own curious Chelifers, so frequently found amongst old papers. Mr. R. H. Meade's monograph of the British species of *Phalangiidæ* appeared in the 'Annals and Magazine of Natural History' for June, 1855. Mr. Macmillan gives another instance of the confusion likely to be caused through the use of our popular English names. *Trombidium Phalangii*, Dugés., is that little pest, now so rampant—the bright red harvest-bug. This is one of the *Acarina* named after our pedipalps (*Phalangium spp.*), because the mite, in its six-legged larva state, is frequently found attached to, and feeding on, them.—E. A. F.]

Abundance of Crane-flies. — We have not, like some of your correspondents (Entom. xii., 224), been troubled with wasps, but in the West Riding of Yorkshire have had an unusual abundance of crane-flies (*Tipulidæ*). They have swarmed everywhere, the moors and grass-lands being equally overrun with them. I repeatedly had the larvæ brought to me by those who do not ordinarily notice such things, and during the last six weeks the imagos have forced themselves on every one's notice. It would have been expected that such immense numbers of larvæ would have seriously damaged the grass, corn, and root crops, but fortunately these do not appear to have been at all injured; the hay crops were everywhere heavy, and the corn, &c., have not looked so well for years.—Geo. T. Porritt; Highroyd House, Huddersfield, Sept. 3, 1880.

Anommatus duodecimstriatus, *Müll.*—I have had the good fortune to find three specimens of this beetle on rotten potatoes when digging the crop in my garden.—THOMAS H. HART; Kingsnorth, Kent, Sept. 15, 1880.

ANTHRIBUS ALBINUS, *Lin.*—I have just had the pleasure of setting a specimen of this rare and beautiful weevil. It was taken on the 8th September by my friend, Mr. Jeffrey, crawling on the hat of a gentleman with whom he was botanising a short distance from Ashford.—ID.

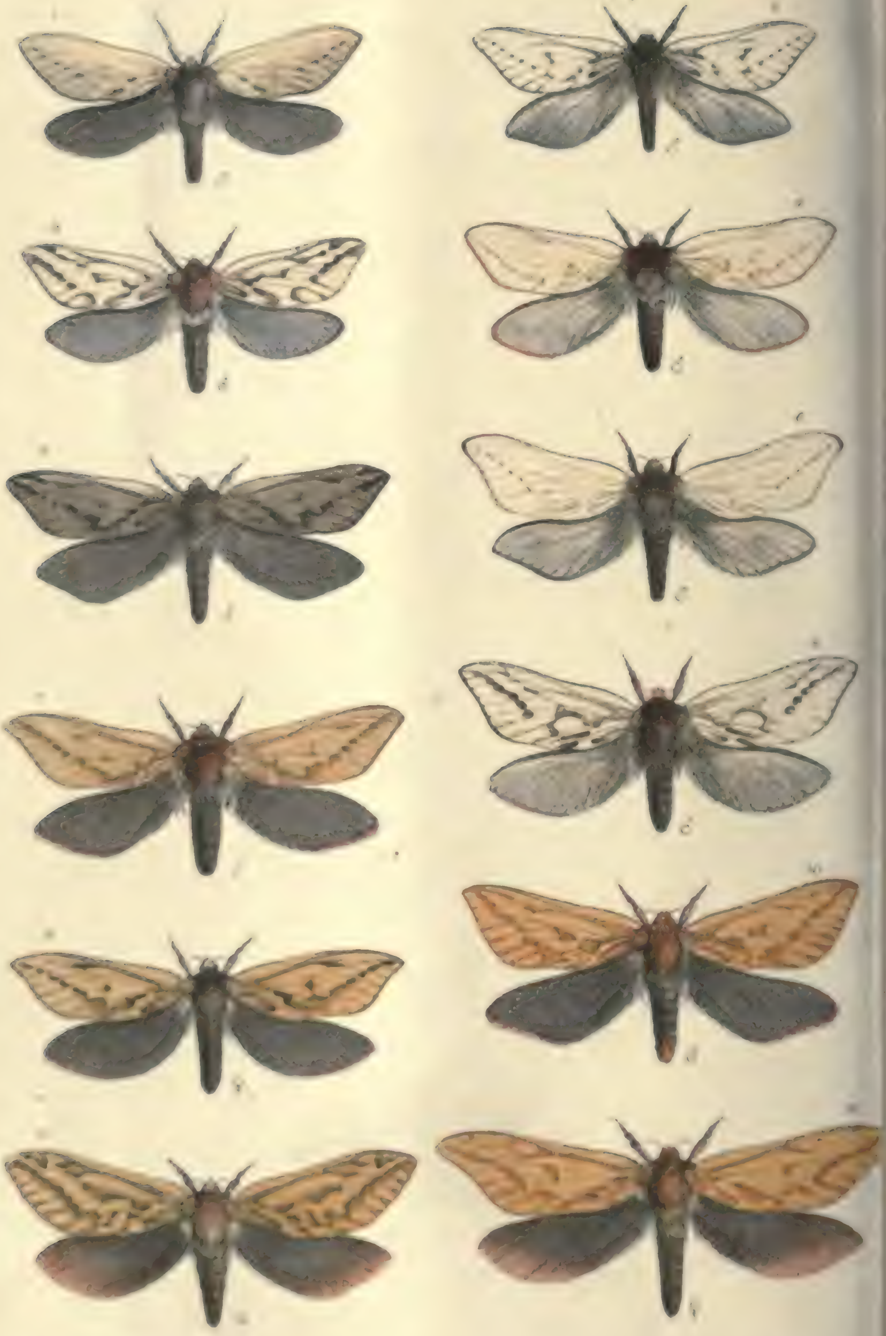
NEWSPAPER ENTOMOLOGY.—In reprinting the following cuttings it is unnecessary to comment on the question of the introduction of elementary entomology into schools.—ED. "It is stated that a capture has been made at Stranraer of a Colorado beetle which flew in at a surgery door on Saturday evening. It is said to be about three-quarters of an inch in length. There was a quantity of larvæ on it when caught, and now, two days after, a number of lively little beetles are disporting themselves on potato and cabbage leaves in their glass prison."—'*Daily Telegraph*,' Aug. 17. 1880. *An Enemy to Cotton.*—"The Chief Entomological Commissioner of the United States has, according to a Southern despatch, just addressed the Cotton Exchange at Mobile on the subject of the cotton-worm, now threatening much damage to the growing crop. *The worm, the caterpillar of an owlet moth, is of triangular shape, about an inch long, the upper wings of a reddish gray*, and the under wings darker. It has legs; but the foremost are so short that in creeping it arches the back like a span-worm. The colour is green, with light yellow stripes and black dots along the back. It grows often to the length of an inch and a half. *Its eggs* are ten to fifteen, deposited on the under surface of the tender leaves, which they resemble in colour, and to which they are firmly attached. Incubation lasts from six to fifteen days."—'*News of the World.*'

OBITUARY.

HENRY RAMSAY COX.—Our readers will regret to learn that Mr. Henry Ramsay Cox, F.L.S., died at his residence, Forest Hill, on September 3rd, 1880, at the early age of thirty-six years. His name was frequently seen in the pages of this and other magazines.—J. T. C.

Entomological Soc. 1880.

Plate



THE ENTOMOLOGIST.

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THE MACRO-LEPIDOPTERA OF THE SHETLAND ISLES.

By J. Jenner Weir, F.L.S., F.Z.S.

(with a coloured plate.)

Mr. Meek deserves the best thanks of entomologists for his spirited enterprise of sending a collector to these islands, who was there for nearly four months, *viz.*, from the end of April until towards the end of August. I had the opportunity, through the courtesy of Mr. Meek, of inspecting the collection made, and I never saw any contribution to our knowledge of insular entomology so interesting, and, I think I may add, more instructive.

During the collector's four months' residence in the Shetlands twenty-five species of Macro-Lepidoptera were collected, some in tolerable plenty, and others were apparently more rarely met with: this no doubt partially arose from his devoting much time to making what may be deemed almost an exhaustive collection of the astonishing varieties and aberrations of *Hepialus humuli*, variety *Hethlandica*, Stgr.

The Shetland Isles, excluding the two detached Islands of Foula and Fair Isle, lie between 59° 48′ and 60° 52′ N. lat., and between 52′ and 1° 57′ W. long., or between 8° and 9° farther north than London. The isles are more isolated from Scotland than England is from the Continent; Lerwick, the capital, is 171 miles from Wick and 115 from Kirkwall, the capital of the Orkney Isles; between these latter islands and the Shetlands the distance of the nearest headlands, excluding Fair Isle, is about 60 miles. This isolation has produced the usual result. Many of the Lepidoptera differ very materially in colour from those of

Scotland, and still more from those of England, but even more remarkably do some of the insular varieties differ from each other than they do from the type of the species.

I find it difficult to offer any explanation of this fact, but it is possible that the struggle for existence, where so few insectivorous birds and no bats exist, may not be so sharp compared with Great Britain, and the necessity for protective coloration being not so great, a wider range of variation in colour may be consistent with the safety of the species.

The islands are very rocky and barren, quite devoid of trees; some of the higher ground is comparatively lofty, one mountain reaching the height of 1500 feet.

The following species were captured:—

Pyrameis cardui, the only butterfly.
Hepialus humuli *var.* Hethlandica, *Stgr.*
H. velleda.
Nemeophila plantaginis.
Xylophasia polyodon.
Charæas graminis.
Mamestra furva.
Agrotis porphyrea.
Triphæna pronuba.
Noctua festiva *var.* conflua.
Pachnobia hyperborea.
Dianthœcia conspersa.
Dasypolia templi.
Aplecta occulta.
Hadena adusta.
Anarta melanopa.
Larentia didymata.
L. cæsiata.
Emmelesia albulata.
Eupithecia venosata.
E. nanata.
Coremia munitata.
Camptogramma bilineata.
Melanippe montanata.
M. fluctuata.

Some of these species present little if any differences from the normal type, and therefore call for no further remark; whilst others are with difficulty recognised as belonging to any known species, and deserve a subspecific name.

Hepialus humuli var. *Hethlandica*, Stgr.—Of this most remarkable insect about one hundred and forty were captured, all of which Mr. Meek kindly showed to me; the variety is very inconstant, and it has been deemed desirable that a plate of the most singular aberrations should be published. The plate contains illustrations of nine males and three females.

Five of the males figured have the dark under wings found generally in the female only; four have the under wings more or less of the usual silvery colour obtaining in the male sex. One undoubted male is coloured almost exactly like a female, the ground colour yellowish, with darker rufous markings. Most of the males have the upper wings more or less spotted with brown and brownish red, and out of the whole number I found but two of the usual silvery colour of the type both on the upper under wings and thorax.

The range of variation in the females is not nearly so great, and the plate shows the most conspicuous aberrations; these are chiefly in the prevailing ground colour of the upper wings, which varies from brown to yellowish buff, and in two of those figured a very rosy hue pervades the lower wings, particularly in the large specimen at the bottom of the plate. I did not find one instance among the females where the silvery colour usual in the males existed, but some of the very large silvery males, with the thorax buff-coloured, might easily have been mistaken for females. It will therefore be seen that the variations consisted generally in the males being coloured more or less like the normal females. The sexes may be readily distinguished by the existence, in the males, of a tuft of long hair-like scales on the hind legs.

It is possible that in the Shetlands an archaic coloration of *Hepialus humuli* is preserved in those specimens where the sexes are alike and resemble the normal southern female in colour, and that the varieties exhibit the changes which the species is passing through towards a perfect differentiation of sexual coloration; this view is strengthened by the fact that the females are coloured to a great extent like the southern type of the species.

It has also been observed in England that when the males are flying in the well-known vibratory manner, the females fly towards and against them; in the Shetlands, where in summer the nights are so much lighter than with us, it is not so necessary that the males should be conspicuously coloured to enable the females to distinguish them. An examination of the plate shows at a glance how much darker the males are in the Shetlands than in England,—one indeed is quite melanic; on the other hand, the females are rarely darker than in the type of the species.

(To be continued; with Plate of other species.)

INSECTS BRED FROM *CYNIPS KOLLARI* GALLS.

By Edward A. Fitch, F.L S.

Meconema varium.

In the 'Entomologist' for May of last year my article on the inhabitants of *C. Kollari* galls appeared (Entom. xii. 113). This treated specially of Hymenoptera met with by Mr. Weston while breeding *Ephippiphora obscurana* and other Tortrices. Since that was written Mr. Weston has continued his observations, and bred many more interesting insects: the interest of Messrs. Bignell, Billups, and Howard Vaughan, was also awakened; and from each of these gentlemen I have received a good collection. Others bred from stores of these galls, but their only inhabitants were the usual gall-makers, inquilines, and parasites—the *Cynipidæ* and *Chalcididæ*. Mr. Bridgman, Mr. Carrington, and Dr. Capron bred nothing else; and from three large jars, containing some hundreds of galls, I only bred three specimens of one of the *Ichneumonidæ*, besides the usual inhabitants. My notes have been deferred for the results of another year's working, but in 1879 these galls have been generally scarce, and I have no collections in hand.

At present it is difficult to account for the presence of some of the insects met with, and but little progress has been made in connecting the various parasites with their hosts. When the species are better known I hope this will be attempted by opening the particular gall from which the emergence takes place; circumstantial evidence of the original lodger will probably be forthcoming.

Without further preface I give a list of the species, and include a few remarks which appear to be useful. My former article should also be consulted.

HYMENOPTERA.

Pœcilosoma submuticum, Thoms. — Mr. Bignell bred one specimen of this sawfly in the spring of this year. The larva of the *Emphytidæ* mostly bore into some hollow stem or similar situation in which to pupate; probably the full-fed larva of this *Pœcilosoma* found an old gall handy. Its earlier stages are at present undescribed; it is not even known to be an oak-feeder. The imago is not rare.

Harpiphorus lepidus, Klug.—Mr. Weston bred a specimen in 1878, and another last year. Mr. Bignell bred one on May 20th, 1879; and Mr. Vaughan also bred a single specimen. This last one had the wings much clouded; but Thomson gives the wings as slightly clouded, so I think it can be no other than a variety of *H. lepidus*. This sawfly is figured by André, in his 'Species des Hyménoptères d'Europe' (pl. xvii., fig. 1), now in course of publication.

CYNIPIDÆ.—*Cynips Kollari*, the gall-maker, and the *Synergi*, its inquilines, were bred commonly by all the observers. Mr. Bignell bred one specimen of *C. Kollari* as late as August 15th, from *old* galls. Of *Synergus*—*S. melanopus*, Hart., *S. Reinhardi*, Mayr., and *S. pallicornis*, Hart., all occurred; the latter being much the rarest.

Fœnus jaculator, L.—Three females of this curious insect were bred by Mr. Weston. *F. jaculator* is well known as a parasite of various *Osmiæ* and *Crabronidæ;* indeed its economy was correctly given by Linné, on the authority of Bergman, in his 'Fauna Suecica,' for he says—parasitic on *Heriades truncorum*, *Chelostoma florisomne*, and *Trypoxylon figulus*. Mr. Weston's examples had most probably lived in the larvæ of *Crabro clavipes;* but the *Fœnus* is a large parasite for so small a host; its emergence from so small a habitation as *Kollari* gall is alone remarkable. These specimens certainly agree with Tournier's *F. terrestris*, as described in his monograph of the genus *Fœnus* (Comptes-rendus, Soc. Ent. Belg., 1877, pp. vi.—x.); but I doubt whether this author has not mistaken Linné's *F. jaculator*. *F. jaculator* is figured in Westwood's 'Introduction,' fig. 74; 8—16; and by several other authors.

? Cryptus sp., Hemiteles spp.—In my former article there are some remarks upon three species of Ichneumonidæ, under these headings. Mr. Weston has again met with these interesting species in some abundance, so that a more satisfactory account can now be given of them. I may say that all were led into error two years ago by several of the specimens having their abdomens so compressed in setting that the male genitalia were protruded; these were erroneously taken to be females. Last year many true females were bred, but with the two sexes these interesting species were most puzzling. They were fully examined by Dr. Capron and Mr. Bridgman, on more than one occasion. First, we agreed they belonged to the *Pimplidæ*, and came near *Echthrus* or *Clepticus;* then we thought they might be found amongst the uncertain genera at the end of the *Tryphonidæ;* at last we came back to the old determination, and settled they must be *Cryptidæ*, and come near *Hemiteles*. They proved so puzzling that Mr. Bridgman wrote me: "The species without a perfect areolet might come in *Hemiteles;* if the petiole were more slender they might squeeze into *Atractodes* (*Ophionidæ*), or if the hinder claws were pectinated they might belong to *Phytodictus;* as it is I think they must belong to the cubical-headed *Pimplidæ*." Again he writes: "In going over my collection I came on three little black males, which I tried as everything last winter, and at last left them at the tail of *Phygadeuon*. I am now delighted to recognise them as the males of Weston's genus." Dr. Capron was equally puzzled between a Cryptid and Pimplid location. Last November I sent thirty specimens (males and females of the two species, and females of the third) to Dr. Kriechbaumer, and he wrote: "Your three species are quite unknown to me, and doubtless they form a most compact genus. They agree pretty well with the *Cryptidæ*, but remind me in many respects (head, antennæ, and structure of metathorax) of the *Xylonomidæ*. Species 2 and 3 Gravenhorst would, I think, have placed with *Hemiteles*. The species also have a great family likeness to *Lissonota*, and may possibly belong to the *Pimplidæ*." He then makes some further detailed remarks, and says, "Shall not you write a short monograph of this interesting genus?" Mr. Bridgman has undertaken this,

and his descriptions and remarks follow this article. The collection was next sent to Herr Brischke, and he named the three species as follows:—"(1) Belongs to *Phygadeuon*, or probably may be *Hemiteles punctatus*, Ratzeburg. (2) Resembles *Hemiteles coriarius*, Taschenberg. (3) Not unlike *Hemiteles monospilus*, but probably new." Later these were sent to Vollenhoven with the above information, but he did not know them, and quite concurred in their forming a distinct new genus. Had Vollenhoven been spared to complete 'Pinacographia,' one or all of the species would probably have been figured in that fine work. I fancy these must be parasitic on the Aculeates, but it may possibly be on the Tortrices.

Phygadeuon obscuripes, Tasch.—Mr. Bridgman tells me that a single female specimen bred by Mr. Billups belongs to this species, which was separated by Taschenberg from Gravenhorst's *P. abdominator*. The numerous species of *Hemiteles* and *Phygadeuon* are very puzzling.

Hemiteles oxyphimus, Gr.—A single female, which appears to be a variety of this species, was bred by Mr. Billups. Like most of the *Hemiteles*, it is very probably hyperparasitic; but Ratzeburg says that Wissmann cut many specimens out of oak bark, where it was probably attached to *Anobium*, and Marshall gives it as bred from *Cymatophora ocularis*, a very different history.

H. similis, Gr.—Mr. Billups bred both sexes of this species. It is generally a common parasite in *Microgaster* cocoons, but Mr. Billups also bred it last year from the mines of *Lithocolletis spinicolella*, and Mr. Bridgman from a spider's nest.

H. bicolorinus, Gr.—This pretty species, which has clouded wings like the common *H. areator*, is also hyperparasitic. Also, like *H. areator*, it is commonly bred from the case-bearing larvæ of various Lepidoptera. Mr. Weston bred one female and Mr. Billups three, one a nice variety.

H. areator, Panz.—Several females again bred by Mr. Weston. See my remarks at Entom xii. 115.

Anomalon geniculatum, Holmgr.—Mr. Weston bred one specimen of a doubtful *Anomalon*, which Mr. Bridgman has, no doubt correctly, determined as *A. geniculatum;* but, he writes, "It differs slightly in the colour of the hind femora from Holmgren's description; still the peculiar arrangement of the posterior discoidal recurrent nervure proves it, I think, to be that species."

A. geniculatum is new to the British fauna. All the species of *Anomalon* are lepidopterous parasites.

Campoplex pulchripes, Holmgr.—This is another species new to our fauna. Mr. Weston bred one female which either belongs to this species (of which the male only is described), or is new. Most probably it was parasitic on one of the lepidopterous inquilines.

Campoplex n. s.?—Mr. Billups bred a male *Campoplex* which certainly does not belong to one of our British species. In sending to Dr. Kriechbaumer, of Munich, it was destroyed, so there is no hope now of determining this specimen. We hope for more.

Limneria majalis, Gr.—Mr. Weston bred one male which it is at present convenient to call this species. Holmgren separated three species from *majalis* for quite trivial differences, and Brischke has just lately split the old species up into several. This was no doubt correct, but bred specimens were wanted with their biology. We do not yet understand the British specimens sufficiently to follow out these minute details. The present is therefore Gravenhorst's *majalis*, and is, doubtless, a micro-lepidopterous parasite.

L. volubilis, Holmgr.—A new British species, which has been referred to by Mr. Bridgman at Entom. xiii. 53. Mr. Weston bred two males and one female from these galls.

Cremastus interruptor, Gr.—Mr. Weston bred one specimen of this species; it was most probably parasitic on one of the Tortrices. I have lately bred the closely allied *C. infirmus* from two-year-old acorns containing *Carpocapsa splendana*, and *C. interruptor* itself has been commonly bred from *R. Buoliana* (Hartig, Ratzeburg, Bernuth, Wttewaall, &c.). It is also said to have been bred by Reissig from *Gelechia dodecella*, and by Giraud from *Nothris verbascella*, but there are several closely allied species. Ratzeburg figures the female in his 'Die Ichneumonen,' pl. vii., fig. 2.

Mesochorus tetricus, Holmgr.—Mr. Billups bred one specimen of this species, which is new to Britain. The genus *Mesochorus* is a very difficult one, and at present very little understood, especially in this country. However, we are improving, as Dr. Capron (Entom. xiii. 89) took thirteen species last year alone (there are only twenty-six in Marshall's Catalogue, and six of these are Curtis's and Haliday's species, unacknowledged on the Continent). The species of *Mesochorus* are certainly hyperparasitic even on different orders, though often apparently bred from Lepidoptera. It is also recorded, and has been observed in this country, that they are external parasites on various insects. See an interesting note on three species of this genus by Mr. Bignell in the last number (Entom. xiii. 245).

Thersilochus saltator, Fab.—Mr. Billups bred two males of this little Ichneumon. Species of *Porizon*, from which *Thersilochus* was separated by Holmgren, are frequently bred from galls; especially *P. harpurus* from the rose bedeguar (gall of *Rhodites rosæ*), and less commonly *P. claviventris* from the oak-galls of *D. scutellaris*. Ratzeburg gives certain species as coleopterous parasites, and Dr. Giraud bred *T. saltator* from *Tischeria angusticollella*.

T. melanarius, Holmgr.—Mr. Billups also bred one female of this small species.

Mesoleius sanguinicollis, Gr.—Mr. Weston bred one specimen. I bred three in July, 1879; curiously this is the only Ichneumon I bred from some hundreds of galls collected in the autumn of 1878. Ratzeburg received the females of this species bred from *Nematus* galls on willows by Herr Brischke, and Vollenhoven saw a specimen emerge from similar galls on sallow. Brischke, in his later work, says "Aus grünen Nematus-larven erzogen." Giraud bred it from *Nematus salicis*, but also from his reed insects (*Cemonus unicolor* and *Lipara lucens*), and gives it, but doubtless erroneously, as a parasite of the *Cemonus*. In our case it was probably parasitic, like the other *Mesoleii*, on *Harpiphorus lepidus*; but I have not yet met with the sawfly. This Ichneumon is figured in 'Pinacographia,' plate 23, fig. 6.

M. armillatorius, Gr.—Mr. Weston also bred one specimen of this pretty species. It is known to be parasitic on many *Tenthredinidæ*.

Exochus globulipes, Desv.—This species has not again been bred, but its determination must be corrected. I did not see either of Mr. Weston's specimens until after my paper was published; they were named by the late Mr. F. Smith. I say this because, of course, they were compared with Desvignes' collection, now in the British Museum, and this is another instance of the great muddle in which is our National Collection of Ichneumonidæ. Mr. Bridgman first pointed out the error, and wrote: "The *Exochus* surely cannot be Desvignes' *globulipes*, because that has an areolet, which this has not." He then gives details of *E. tibialis* and *E. alpinus*, and concludes with "It is a question if such trivial distinctions [the absence of areæ on the metathorax] have any right to be raised into a species." Brischke, who has returned these specimens as *E. tibialis*, Holmgr., without a doubt, says, "*E. tibialis*, Holmgr., female, appears to me to be equal to *E. alpinus*" (Schrift. K. P-o Gesell. Königsberg, xi. 100). The case now stands, therefore, that these two females are *E. alpinus*, Zett., var. *tibialis*, Holmgr.; and if *E. tibialis* be a good species it is British. Vollenhoven's figure ('Pinacog.,' pl. 8, fig 9) of *E. tibialis* leg, cannot be quite correctly coloured.

Ephialtes carbonarius, Christ. ?—Three males and one female, again bred by Mr. Weston, may possibly be referable to this species, but see my remarks at Entom. xii. 116. *E. carbonarius* appears to be attached to the larger wood-boring Longicorn Coleoptera (*Cerambyx*, *Saperda*, &c.), and it is quite possible that Gravenhorst's *E. gracilis* is the *Aculeata* parasite, and a good species. Mr. Bignell also bred one male specimen of an *Ephialtes*. The species with the red prothorax may be *Perithous divinator*, Rossi—a known parasite of *Cemonus*, *Pemphredon*, and *Trypoxylon*.

Clistopyga incitator, Fab.—Mr. Bignell bred one specimen, but Mr. Weston did not again meet with this species.

Lissonota sp ? — One specimen bred by Mr. Weston. It appears to be quite unknown as a British species. Mr. Bridgman and Dr. Capron could not determine it, and it is not in the National Collection. Dr. Kriechbaumer returned it as "neither in Gravenhorst, in Holmgren, or in Brischke, and not in our (Munich) collection"; but on subsequently sending it to Herr Brischke it was returned as "either *L. carbonaria* or *melania* of Holmgren." So we must leave it; no doubt it was parasitic on one of the Tortrices.

Spathius rubidus, Rossi. — A small female of this pretty Braconid bred by Mr. Billups. Both our British *Spathii* are well known as parasites of certain xylophagous Coleoptera (*Anobium*, *Hylesinus*, &c.), and Bargagli bred it from *Phlœotribus oleæ*. Giraud bred *S. rubidus* from *Xiphydria dromedarius* (*Siricidæ*), and named a new species *S. gallarum*, which he bred from the galls of *C. conglomerata*, which are so very closely allied to *Kollari*. Ratzeburg figures the female of *S. clavatus* ('Die Ichneumonen,' pl. vii., fig. 10).

Chelonus sulcatus, Jur.—One specimen bred by Mr. Billups. The Chelonides are mostly parasitic on various Tortrices. This species is figured by Jurine, pl. xii., fig. 41.

Ascogaster rufipes, Latr.—Mr. Billups also bred one specimen of this species.

Apanteles sp. ?—In 1878 Mr. Weston bred three specimens of an *Apanteles* (Entom. xii. 116); last year Mr. Billups bred one. The specific determination must be left.

Orgilus obscurator, Nees.—This species was described as three by the careful Nees, and Ratzeburg figures it (pl. vii., fig. 9) under Hartig's name of *Macropalpus* (*Eubadizon*) *leptocephalus*. Vollenhoven also figures *Orgilus* in 'Pinacographia' (pl. 29, figs. 8 and 9). Ratzeburg and several other writers give this as a common parasite of *Retinia Buoliana*; it is also recorded from a *Depressaria*, a *Gelechia*, and a *Coleophora*. Mr. Weston bred one male from these galls, where it was probably parasitic on *Ephippiphora obscurana*. Walker bred the allied *Therophilus rufipes* from galls both of *C. Kollari* and *A. terminalis*.

Aphidius rosarum, Nees.—Mr. Billups bred an *Aphidius*, which I cannot separate from *A. rosarum*. *Cemonus* and its allies provision their nests with *Aphides*; this probably would account for its occurrence, but Mr. Billups bred no bees.

Microctonus sp. ?—Mr. Billups bred a single female which certainly belongs to this genus, but I cannot determine it with any certainty from Haliday's descriptions of *Perilitidæ* in the third volume of the 'Entomological Magazine.'

Perilitus sp. ?—Mr. Weston bred a male *Perilitus*; without the other sex it is almost impossible to determine it. The Perilitides, of which Vollenhoven's beautiful plate is just published, are mostly lepidopterous parasites.

Rhizarcha areolaris, Nees.—Mr. Billups bred one specimen of this little *Dacnusa*.

Dacnusa sp. ?—One specimen belonging to this genus also bred by Mr. Billups. The *Dacnusidæ* are almost exclusively parasitic in leaf-mining or gall-making Diptera; their presence in these galls must be quite accidental.

CHALCIDIDÆ. — All observers bred these in bewildering numbers, as might be expected. Mr. Howard Vaughan's collection was very complete. The species commonly met with were *Eurytoma rosæ*, Nees (very common); *Decatoma biguttata*, Swed. (common); *Syntomaspis caudatus*, Nees (uncommon); *Callimome regius*, Nees (very abundant); *Megastigmus dorsalis*, Fabr. (not common); *M. stigmaticans*, Fabr. (common); of *Ormyrus tubulosus*, Fonsc., I bred three females and one male I believe, from these galls, but possibly they might have been from those of *A. Sieboldii*; *Eupelmus urozonus*, Dalm. (not generally common), expressively called "the little cock-tail" by Mr. Vaughan, figured by Haliday (see Entom vi. 226), and by Dalman; *Pteromalus fasciiventris*, Westw. (very common); *P. tibialis*, Westw. (very abundant); also another Pteromalid, which is common, but at present undetermined. In addition Walker bred *Callimome abdominalis*, Boh., and *Decatoma flavicollis*, Wlk. Dr. Mayr bred three males of *Diomorus calcaratus*, Nees, and two specimens of *Eurytoma nodularis*, Boh., from the old galls inhabited by *Stigmus pendulus*, in whose larvæ they are parasitic; but, of course, from the various insects now ascertained to be casual inhabitors of these galls, a very fine collection of *Chalcididæ* might be expected.

Proctotrupes gravidator, Linn.—A fine female of *P. gravidator*, also one of the black species, were bred by Mr. Billups. The *Proctotrupidæ* are mostly parasitic on fungivorous Diptera, and the probable explanation of their presence in these galls is that the imagos found them a convenient hybernaculum. Two plates in 'Pinacographia' (pl. 18 and 19) well illustrate this family.

Megaspilus sp.?—One specimen belonging to this genus was bred by Mr. Billups. Bouché bred a *Megaspilus* from *Syrphus* pupæ, and other species are frequent parasites of *Aphides*. This specimen, doubtless, had a similar origin to the *Aphidius*, also bred by Mr. Billups; but it is impossible to trace it exactly.

Homalus (*Hedychrum*) *auratus*, L.—Mr. Weston again bred four specimens of this Chrysid. It must have been reared at the expense of one of the Fossores.

CRABRONIDÆ.—As said in my former article, it is no uncommon thing for *Crabronidæ* to make their nests in these galls after they have been pierced by the exit of the *Cynips* (Entom xii. 118). Two species were received in Mr. Weston's first collection; these have been again met with, and three others in addition. Mr Bignell has also bred *Crabro clavipes* in June, 1879. The species now to be recorded are:—*Rhopalum* (*Crabro*) *clavipes*, L.; three specimens by Mr. Bignell, and four by Mr. Weston. *Stigmus pendulus*, Panz.; five by Mr. Weston. *Passalœcus insignis*, Van d. Lind; six by Mr. Weston. *Cemonus unicolor*, Van d. Lind; one by Mr. Weston. *Psen pallipes*, Panz.; two by Mr. Weston. Mr. Walker bred one *Passalœcus gracilis*, Curt., in May, 1874.

Prosopis rupestris, Smith.—This has not again been met with, but I think it should be recorded that Mr. Bridgman says of it "The *Prosopis* has the same marked face—three bars of white—in the male as *P. communis*, and I think can only be that species." Mr. Edward Saunders has expressed a similar opinion. When we know that Forster has described ninety-four, and thirteen doubtful, species of *Prosopis* as European, many of which occur in the neighbourhood of Aix-la-Chapelle, it is difficult to believe that our fauna only includes ten species; probably many of the smaller species of these rather obscure bees are still unrecognised in this country. Breeding from old *Kollari* galls may possibly give us an introduction.

LEPIDOPTERA.

The Lepidoptera bred from these galls have already been referred to (Entom. xi. 239, xiii. 91). Mr. Weston has bred *Tortrix viridana*, *Ephippiphora obscurana*, *Coccyx splendidulana*, *C. argyrana*, and *Eupœcilia maculosana*. Dr. Gill bred *Eurymene dolabraria*, *Heusimene fimbriana*, *Catoptria Juliana*, *Cryptoblabes bistrigella*, *Ephippiphora obscurana*, *C. splendidulana*, *H. fimbriana*, and *Lemnatophila salicella*; the occurrence of the Geometer is curious, and the life-history of the knot-horn has only lately been made known. In May, 1874, Mr. Walker bred one specimen each of *C. Juliana* and *Dasycera sulphurella*.

DIPTERA.

Two species of Diptera were bred by Mr. Weston. They have been identified by Mr. Meade as follows.

Thryptocera setipennis, Fall.—The female of this species was bred. It belongs to the *Tachinidæ*, a family containing numerous species which are mostly parasitic internally on the larvæ of several orders of insects; a few species have been found in the nests of various bees, especially the Fossores. *T. setipennis* is a species new to Britain, and Mr. Meade has kindly sent me the following information:—"It is a rather rare and interesting species. Zetterstedt says that it is common in the central and southern parts of Scandinavia, and that the pupæ are sometimes found under moss on trees. Schiner remarks that Boheman has found the pupæ in the body of *Forficula auricularia*. This is all that I can find about the life-history of this parasite, and I do not see how its living upon earwigs will account for its being found in a gall, unless an earwig had taken possession of an old gall with a hole in it, and had died there." This is by no means unlikely.

Anthomyia pluvialis, L.—One female bred. Mr. Meade writes:—"This is often found about the leaves and bark of fruit trees, but nothing is known to me about the food of its larva." Mr. Walker also bred this common species from the common oak-apple (*A. terminalis* galls), and, like many of the *Anthomyiidæ*, the larvæ probably live on decaying vegetable matter.

COLEOPTERA.

Olibrus æneus, *O. geminus*, *Dasytes æratus*, *Anaspis maculata*, *Orchestes quercus*, *O. iota*, *Tachyerges salicis*, *Cœliodes quercus*, *Mecinus pyraster*, *Coccinella bipunctata*, *C. variabilis*, and *C. 14-punctata* were all bred, more or less abundantly, by Mr. Weston. The too common *Phyllotreta undulata* occurred to Mr. Bignell in May. These call for no special remarks, as probably all had hybernated in the old galls as imagos, for which they are very convenient. It is these hybernators more than the legitimate inhabitants which are so attractive to the various titmice.

ORTHOPTERA.

Meconema varium, Fabr.—The extraordinary insect figured at the head of this article is the young of this species, probably about two days after leaving the egg. *M. varium* is interesting to British entomologists, as it is our only indigenous locust. Walker, Von Heyden, Hofmann, Rudow, and Mayr have all recorded *M. varium* as a not infrequent inquiline in *A. terminalis* galls. Leopold Fischer, in his great work on the Orthoptera Europæa, says:—"D. de Heyden larvas sæpe numeroque satis magno e gallis Cynipis Quercus terminalis educavit mecumque larvam adhuc mollem, exiguam (1‴ langam) benevole communicavit, quæ exeunte majo oro exclusa erat necdum exuvias mutaverat" (p. 241). This is the only reference I find to the remarkable long-legged, long-antennæed, spotted creature which is the young of this Locustid. Fischer well figures the imagos, which are generally common in August and September on oak trees, in both sexes, on his plate xii., figs. 19 and 20. In the middle of May of last year Mr. Bignell bred three of these young larvæ from galls collected the previous autumn; hence *M. varium* must hybernate as an egg.

NEUROPTERA.

Elipsocus Westwoodii, M'Lach. — Two Psoci bred by Mr. Bignell (one on 19th May and one on 16th August, 1879) were thus named for me by Mr. M'Lachlan, who adds, " The neuration of the specimen on the oblong card is in an abnormal condition on the right anterior wing; this and the different setting made it appear a separate species." In 1872 I bred some eight or ten *Psocidæ* from these and *terminalis* galls which I sent to Mr. Walker, who also had bred several examples. Mr. M'Lachlan suggests that they enter the old pierced galls as larvæ to feed on the vegetable débris. This is most probable, as Mr. Bignell had kept the galls from which the last specimen was bred very nearly a twelvemonth.

Hemerobius subnebulosus, Steph.—In the spring of this year Mr. Bignell bred two specimens of this *Hemerobius* from the old galls; they were identified by Mr. M'Lachlan. This appears to be the same species that Mr. Walker bred in April, 1874, from galls collected in the autumn of 1873. The *Hemerobiidæ* are well known Aphis-devourers in the larva state, so it is probable that the galls are only used as convenient shelter for their cocoons.

Maldon, Essex, August, 1880.

THREE NEW ICHNEUMONS.

BY JOHN B. BRIDGMAN.

THE three species of *Ichneumonidæ* now described apparently belong to the same group, and notwithstanding their general Pimplid look may fairly be placed between *Phygadeuon* and *Hemiteles;* but for their affinities see the article on the gall-bred insects by Mr. Fitch. They are all, I believe, undescribed, so a specific description is given of each and of the general characters of the genus, although possibly the red-banded species may not exactly belong to it. It is, however, impossible to deal exhaustively with the group until the genus *Hemiteles* has undergone a similar revision to that of *Cryptus* and *Phygadeuon* at the hands of Thomson.

Hemiteles monospilus, described by Gravenhorst and Taschenberg, is very much like the red-banded species in colour and size, but the description of the metathorax is very different from our insect. Taschenberg places it in a division having "the metathorax elongated, without complete areæ, the back part very oblique, almost confused with the upper part." In our species the two parts are of equal length and at almost right angles.

CECIDONOMUS, nov. gen.

Head more or less globose; antennæ filiform, shorter than abdomen. Width between the eyes and base of mandibles equal to width of base of mandibles. Thorax a little longer than high; legs moderately slender; wings with or without areolet, if present then pentagonal; posterior inferior angle of prædiscoidal cell, acute; metathorax with five more or less distinct areæ, the supero-medial more or less subpentagonal; thorax alutaceous.

Abdomen subpetiolated, depressed somewhat, apex more or less compressed, 1st segment gradually tapering, with tubercles; aculeus about as long as the abdomen; abdomen about as long as the head and thorax and about as wide as the thorax, the widest part being at the apex of the 2nd segment.

Cecidonomus Westoni, n. sp.

Length 4—6 mill., female. Black; head, thorax, and abdomen black, legs red, apex of intermediate sometimes deeper; apex of hinder femora, tarsi, and tibiæ fuscous; this latter base and middle paler-banded.

Head and thorax coarsely alutaceous, abdomen coarsely and closely punctured, punctures running into each other; metathorax coarsely wrinkled, areæ distinct, supero-medial pentagonal with the lower sides shorter than the upper ones; areolet of wings pentagonal, transverse anal nervure divided below the centre; antennæ about two-thirds the length of the body; aculeus a little longer than the abdomen. Male differs only in having the front and intermediate coxæ fuscous, more or less pale at the apex, and the hinder ones black.

Fifteen males and nine females bred by Mr. Weston from galls, 1878—9.

Cecidonomus gallicola, n. sp.

Length 4—6 mill., female. Black; legs red, coxæ and trochanters black, apex of hind tibiæ and tarsi sometimes fuscous.

Head and thorax finely alutaceous, first three segments finely alutaceo-punctated, rather more coarsely marked than the thorax, the remaining segment glabrous; areæ of metathorax not so distinct as in the former species, and in form an irregular hexagon, broader than long, narrower in front than behind in the female, more regular, about as broad as long in the male; wings with no areolet, transverse anal nervure divided in or just below the centre; antennæ about two-thirds the length of the body; aculeus a little longer than the abdomen. Male like the female, but has the front and intermediate coxæ fuscous at the base, the hinder entirely so; trochanters red, except the base of the hinder ones.

The finer sculpture, shining apex of the abdomen (and dark coxæ and trochanters in the female), readily distinguish this species.

Two males and four females bred by Mr. Weston from galls, 1878—9. I have taken three males at Norwich.

Cecidonomus ? rufus, n. sp.

Length 4—5 mill., female. Black; 2nd and base of 3rd segment of abdomen and legs red, the apex of intermediate and posterior tibiæ and tarsi more or less fuscous.

Head and thorax finely alutaceous; abdomen densely and finely punctured on the 1st segment running into each other; antennæ about two-thirds the length of the body. Wings without areolet, transverse anal nervure broken below the centre; areæ of metathorax distinct, supero-medial varies from a blunt-ended pentagon to a blunt-ended hexagon, about as broad as long, the lower side areæ being shorter than upper ones; aculeus as long as the abdomen and distinctly curved downwards.

Two females bred by Mr. Weston from galls in 1878, and one in 1879. I have also taken two females near Norwich.

Erratum.—Page 261, under LEPIDOPTERA. *Heusimene fimbriana*, *Catoptria Juliana*, should come after *C. argyrana* in the previous line, among the species bred by Mr. Weston.

INTRODUCTORY PAPERS ON LEPIDOPTERA.

By W. F. Kirby.

No. XVI. NYMPHALIDÆ—NYMPHALINÆ.

(HYPOLIMNAS.)

Few genera of *Nymphalidæ* are more interesting than *Hypolimnas* and its allies, which are almost exclusively confined to the East Indies and Africa. They are insects of considerable size, expanding three or four inches, with more or less dentated wings, and the prevailing colour is generally brown and white, varied with blue. Several species mimic *Danainæ* to a most remarkable extent.

H. Misippus, Linn., is found throughout tropical Asia and Africa, and is also met with (though probably introduced) in Trinidad, and in several localities on the north coast of South America. It is of a rich dark brown, with a large white spot, shading into blue on the edges, in the middle of each wing. On the under side of the hind wings is a broad whitish band, filling up the central third of the wing. The female is so exact a counterpart of *Danaus Chrysippus*, Linn., that the only difference which strikes the eye at first sight is the presence of one black spot instead of four in the centre of the hind wings. There is a rarer variety of the female (*Inaria*, Cram.), in which the white band at the tip of the fore wings is absent, thus giving it a striking, though less strongly marked, resemblance to *D. Dorippus*.

The next species is *D. Bolina*, Linn. The male is very similar to that of *Misippus*, but the white band on the under side of the hind wings is much narrower and duller, and the large spots above are more blue than white; there is also a submarginal row of small whitish spots round all the wings. The female is a large dark brown butterfly, and varies very much; the wings are frequently marked with masses of orange or white, and the hind wings are often bordered with dull white. Only long-continued observations on its range and transformations will inform us whether this is really a polymorphic species, in which the males are very similar, while the females vary greatly; or whether it consists of a cluster of closely-allied species. I do not think that we have sufficient data to decide the question at present. *D. Bolina* is met with throughout the East Indies and the Eastern Islands.

Of the remaining Eastern species I may mention *H. Alimena*, a brown butterfly about three inches across the wings, with submarginal white spots, and a blue band within; and *H. Pandarus*, a considerably larger insect, with brown fore wings, with a submarginal row of bluish white dots, and a broad pale blue band across the middle of the hind wings, followed by a row of bluish spots surrounded with black, and bordered outside and at the anal angle with orange. In the female there is a broad transverse buff band on the fore wings, followed by a row of white spots, and white connected crescents nearer the hind margin; the hind wings are reddish orange from the centre nearly to the hind margin, on which is placed a series of rather large oval black eyes with bluish white pupils. This splendid insect, one of the largest of the *Nymphalidæ* (expanding four inches in the male and five in the female), is met with in Amboina and Ceram, but is represented by smaller allied forms in most of the neighbouring islands. *H. Anomala* and its allies are Indian or Malay species (brown, with a marginal row of pale spots), which are chiefly remarkable for their striking resemblance to some of the more obscure species of *Euplœa*.

Hypolimnas is represented in Africa by several handsome species, of which I will only mention two:—*H. Salmacis*, a fine insect, measuring four inches across, brownish black, broadly banded with blue and white, which is common in many parts of the country; and *H. Dexithea*, a species of equal size, found in Madagascar, which has black fore wings, with a broad transverse white band, and white spots near the tip; the hind wings are white, bordered with red in the middle and black at the base; the hind margin is also black, with bluish white festoons; on the under surface the black markings are entirely replaced with red, except a broad band on the inner margin of the fore wings, and the festooned black and white borders of all the wings.

THE TORTRICES OF SURREY, KENT, AND SUSSEX.

By Walter P. Weston.

(Continued from p. 238.)

Pyrodes Rheediella, Linn.—Distributed throughout, but not common. The imago appears in May and June, and is to be met with at the flowers of the whitethorn.

Catoptria albersana, Hub.—Not uncommon in the outskirts of woods. The imago occurs in May and June, and flies towards dusk. The larva feeds on the honeysuckle in August.

C. ulicetana, Haw.—Abundant everywhere among furze (*Ulex europæus*). The larva also feeds on *Genista anglica* and *Lotus corniculatus.*

C. juliana, Bent.—Distributed throughout, but not a common species. The imago appears in July, and should be looked for on oak trees or palings near, especially during windy weather. The larva feeds in the acorn in autumn, and is full fed about the time the acorn falls; it then wanders out to pupate, but I do not think the actual change takes place until the spring.

C. microgrammana, Guen.—Local and rare. The imago appears in June and July among rest-harrow (*Ononis*), and has occurred at Deal, Folkestone; Box Hill and Croydon.

C. hypericana, Hub.—Distributed throughout, and not uncommon among St. John's wort. The imago appears in June and July, and flies freely at dusk; it is also easily disturbed in the sunshine. The larva feeds in the heads of *Hypericum perforatum* and *H. hirsutum.*

C. conterminana, H.-S.—Local and rare. The imago appears in June, and is to be met with among various kinds of lettuce. It has been taken and bred in some numbers from the neighbourhood of Dartford.

C. Wimmerana, Wilk. non Treit.—Local. The imago appears in July, and is not uncommon amongst sea wormwood (*Artemisia maritima*) along the bank of the Thames below Gravesend.

C. fulvana, Steph.—Local and scarce. The imago appears in July amongst the great knapweed (*Centaurea scabiosa*), and appears restricted to the chalk. It has occurred at Folkestone, Dover; and Headley Lane, Mickleham.

C. cana, Haw., = *Scopoliana*, Wilk.—Distributed throughout. The imago appears in June and July, and is not uncommon among thistles, particularly in dry situations. It flies freely at dusk, and is also to be seen during the day at rest upon the leaves.

C. Scopoliana, Haw., = *Hohenwarthiana*, Gn., Wilk.—Notwithstanding that the doubts attending the nomenclature of this and the two preceding species have been cleared up by Mr. C. G. Barrett (E. M. M., vol. x., pp. 4—6), some confusion still exists owing to the fact that *Scopoliana*, Wilk., is now known as *Cana;* and *Hohenwarthiana*, Wilk., becomes *Scopoliana*. Common throughout these counties. The imago appears in June and July among black knapweed (*Centaurea nigra*), in the seed-heads of which plant the larva feeds.

C. cæcimaculana, Hub.—Distributed throughout; nowhere common. The imago appears in July among mixed herbage, and chiefly upon the chalk. It has occurred at Croydon, Caterham, Box Hill; Darenth, Folkestone; Brighton and Lewes.

C. decolorana, Frr. — Local. Mr. Machin records having reared this species in some numbers from larvæ feeding in the seed-heads of golden-rod (*Solidago virgaurea*), collected at the end of September and in October, in woods in Kent and Surrey. The imago appears in June and July among golden-rod, and is to be met with on the wing at dusk. Hitherto confounded with the following species.

C. æmulana, Schl., = *modestana*, H.-S., = *tripoliana*, Barrett. —The reasons for altering the nomenclature of this species to *C. tripoliana* will be found in Mr. C. G. Barrett's notes on Tortrices (E. M. M., vol. xvii., p. 84). The imago appears not uncommonly along the bank of the Thames among *Aster tripolium* in July, and flies freely at dusk. The larva feeds in the seed-heads of the same plant, and is full-fed towards the end of September or early in October.

C. expallidana, Haw.—Local and rare. The imago appears in June and July, and is to be found on chalk downs and grassy banks. It has occurred at Folkestone, Dover; and Caterham.

C. citrana, Hub.—Local and rare. The imago appears in July, and has occurred at Folkestone and Hastings. The larva is said to feed in the flowers of *Artemisia campestris*.

Trycheris mediana, W. V.—Local. The imago appears in

July, and I have frequently found them at rest on various flower-heads; it flies in the hot sunshine. The localities are near Strood, Darenth, Folkestone; Mickleham, Croydon; and Hastings.

Simaethis vibrana, Hub.—This species was discovered at Folkestone by Dr. Knaggs, in June, 1860, since which time it has occurred there once or twice singly.

Choreutes scintilulana, Hub. — Distributed throughout in moist and open situations in woods. The imago appears in July and August, and flies with a dancing motion in the hot sunshine. The larva feeds on the common skullcap (*Scutellaria galericulata*).

Xylopoda Fabriciana, Linn.—Abundant everywhere among nettles, upon which the larva feeds, and spins a neat white cocoon among the leaves in which it pupates. There appears to be a continual succession of broods of this insect from May to October, and it is sometimes to be met with even later.

X. pariana, Linn.—Abundant throughout. The imago should be looked for in September among apple orchards, and is very partial to the flowers of the marigold, especially in the early morning. The larva feeds on the apple.

Lobesia reliquana, Hub.—Not uncommon in oak woods among the second or third year's growth. The imago is very abundant, flying gently at dusk over the tops of the oak bushes.

L. Servillana, Dup.—Local and rare. The imago appears in May and June among sallows, and has occurred at Darenth Wood; and Haslemere.

Eupœcilia nana, Haw.—Abundant everywhere among birch. The imago appears in May and June, and again in August, and is easily to be obtained at dusk flying round the trees, or it may readily be obtained by beating; but the small size of some of the specimens renders them liable to escape notice. The larva is said to feed in the catkins of the birch.

E. dubitana, Hub.—Very abundant on railway slopes and broken ground near London; it appears equally distributed throughout. Like the preceding species it is double-brooded, the imago appearing in May and June, and again in August. I have several times found this species very abundant, both among ragwort and the ox-eye daisy. The imago is only to be seen at dusk, when it flies freely.

E. pallidana, Zell., = *albicapitana*, Cooke. — Local, and generally to be found on chalk. This species has occurred at Darenth, Folkestone; Box Hill; and Worthing.

E. atricapitana, Steph.—Local. The imago is to be met with among ragwort in chalky districts, in the blossoms and stems of which the larva feeds. The species is double-brooded, in May and August; and has occurred at Charlton, Dover, Folkestone; Box Hill, Caterham; Brighton and Hastings.

E. maculosana, Haw.—Common in all woods in May and June. The imago flies freely in the morning sunshine, and the white under wings of the male render it rather conspicuous. The female is more difficult to catch. There is a second brood in August, but much less plentiful than the spring brood.

E. sodaliana, Haw.—Local and rare. The imago appears in May and June among buckthorn, and has occurred at Croydon, West Wickham, Sanderstead; Darenth, Deal, Folkestone; and Tilgate Forest. The larva feeds on *Rhamnus catharticus*.

E. carduana, Zell., = *hybridellana*, Hub.—Local, but not uncommon. The imago appears in July and August. Mr. C. G. Barrett (E. M. M., vol. xv., p. 141) says the larvæ are in the seed-heads of *Picris hieracioides*, and are full-fed in August and September. It is distributed pretty generally throughout these counties.

E. ambiguella, Hub.—Local and rare. The imago appears in July among *Rhamnus frangula*, in the berries of which plant the larva is believed to feed. This insect has occurred at West Wickham, Haslemere; and Tilgate Forest.

E. angustana, Hub.—Abundant on heaths and moors, and is also to be found in woods and on chalk slopes. There are a succession of broods from May to the end of August. The larva feeds on heath, plantain, and various other plants.

E. curvistrigana, Wilk.—Rare and local. The imago occurs in July and August among golden-rod (*Solidago virgaurea*), in the flowers of which plant the larva feeds. The localities are Deal, Dover; Lewes, Hastings; and Haslemere.

E. Vectisana, Westw.—Almost entirely confined to salt marshes and river banks. It occurs along the Thames below Gravesend. The imago is to be met with in July.

E. affinitana, Dougl.—Is to be found in similar situations as the preceding species. The imago occurs in July among sea-thrift (*Statice armeria*), upon which the larva feeds.

E. udana, Gn.—Local. The imago appears in July and August in marshy meadows. The larva feeds in the stems and petioles of the leaves of *Alisma plantago*, boring a gallery in the interior, where it changes to a pupa. It has occurred around London; also at Haslemere, Hastings, and Deal.

E. Manniana, F. v. R.—Very rare and local. A single specimen is recorded by Mr. C. G. Barrett as captured by himself at Haslemere; and one specimen is also mentioned in the list of Hastings and neighbourhood.

E. notulana, Zell. Local. The imago appears in July among *Mentha hirsuta*, in the stems of which the larva feeds. It is not uncommon at Folkestone.

E. rupicola, Curt.—Local, but abundant where it occurs. The imago appears in August among hemp agrimony (*Eupatorium cannabinum*), and flies freely on calm evenings. The larva probably feeds on this plant. The localities are Deal, Dover, Folkestone; Hastings and Haslemere.

E. flaviciliana, Doub.—This species is to be met with on chalk downs in July and August, but is not common. The localities are Sanderstead, Epsom; Deal, Folkestone.

E. roseana, Haw.—Common everywhere among teazle (*Dipsacus sylvestris*). There is a succession of broods from May to August. It can be reared in plenty from teazle-heads collected in the spring.

E. Heydeniana, H.-S.—Not uncommon in one or two localities in the north of Kent; and also at Hastings. There are three distinct broods, appearing in May, July, and September. The larva feeds in the seed-heads and stems of the common chamomile in June, August, and October.

E. ciliella, Hub., = *ruficiliana*, Haw.—Local, but not uncommon where it occurs. The imago appears in May and June, and generally among the common cowslip, in the seed-heads of which, as well as other kinds of *Primula*, the larva feeds.

E. anthemidana, Curt.—Local. There are three broods, appearing in May, July, and August. The larva feeds on *Anthemis cotula*. It is not uncommon in North Kent; and also occurs at Croydon.

(To be continued.)

NOTES ON THE LEPIDOPTERA OF NATAL.

By William D. Gooch, C.E.

(Continued from p. 231.)

Pieridæ.

Leaving the *Papilios*, I must next notice the most delicate Natal butterfly, *Pontia Alcesta*, the first representative of the *Pieridæ*. Mr. Spiller seems not to have met with it yet. It is a bush-frequenter—loves damp shady places in the bush itself; it flies slowly, and is very difficult to catch on account of the thick branches in its bushy haunts; and, from its exceeding fragileness and delicacy, to handle it roughly is to spoil it. It has evenly-rounded wings of diaphanous white with a clouded tip, and one round black spot on the fore wings. It is the only representative of the genus so far known in Natal.

The *Pieridæ* come out in considerable force, although perhaps not being so well represented as might have been expected. The varieties of *P. Agathina* are very interesting, the colour varying from pale yellow to almost an orange. I have bred *P. Agathina*, *P. Pigea*, and *P. Severina*. The larvæ are very similar to the *Pieridæ* larvæ we know so well in England. I agree with Mr. Spiller in his remarks that many of the *Pieridæ*, and especially the genus *Anthocharis*, may be only winter and summer forms of the same butterflies; but in the only two instances where I have been able to test, by breeding, the truth of this opinion, viz., *Anthocharis Omphale* and *Pieris Severina*, I found the winter and summer products were exactly the same. It is true the broods were reared under similar influences in my experiments, being protected from the weather in an open room or verandah. Both were theoretical winter varieties, if we take the vars. with least black as belonging to that season, and they came out similarly in the summer brood. As I said before, the fact of my artificial experiment must not be taken as a certain negation of the alternate brood theory; and I think Mr. Spiller will be doing great service to the cause of Science if he directs his attention to the careful working out of this problem.

The *Anthocharinæ* are great favourites with collectors, and, speaking from my own experience, amply repay the long walk you may take to get to their haunts; for, although they are very local, a handsome boxfull is soon obtained, as they are also gregariously inclined, and the occurrence of one specimen generally means many. I remember my delight at a fine series of *A. Ione*, with his black encircled violet tip, and *A. Danaë*, with the crimson blotch and black markings, and their respective wives with only black markings, which I took on the edge of a patch of trees and bush in grass-land not five miles from Durban inland. Mr. Spiller speaks of *A. Ione*, but not of *A. Danaë;* the latter should be plentiful where he is residing. All the more handsome insects of this tribe have the female much less vivid in colouring. This also is a fact for Mr. Spiller's attention. In the breeding especially the variations of the female and male, even in the larval stage, are very marked, and often significant of derivation or of life necessities.

Two handsome genera of butterflies, rather rare, or at all events local in Natal, and related to the foregoing, are *Idmais* and *Thestias*. They are sometimes abundant in grass-land, more especially on higher ground away from the low coast-lands.

Of *Eronia* and *Callidryas*, as "good wine needs no bush," so these need no recommendation. The beauty of their form and strong flight are most attractive. *E. Leda* is a great favourite, the sulphur wings with orange tips being very brilliant. *E. Cleodora* is handsome, especially the under side. The black margin of the wings varies much in depth with the dry and wet seasons, as has been remarked in *P. Merope*. *C. Florella* is delicately coloured, and is caught feeding at the flowers of *Labiatæ* in the afternoon very abundantly. I have seen several *C. Rhadia*. I think it is found more abundantly up in the higher lands, and that may account for Mr. Spiller's having so seldom seen it.

The species of the genus *Terias*, which are not very noticeable, complete the rather full series of *Pieridæ* which Natal yields to a successful net. I do not know the transformation of these latter species.

DANAIDÆ.

The *Danaidæ* claim our attention, not on account of their number, but of the fact that they are the centre upon which mimetic tendencies in the *Papilionidæ* and *Nymphalidæ* seem to meet; *Danais Chrysippus*, being mimicked by *Diadema Misippus*, male, and by *Papilio Merope* (var. *ochreus*), female, *D. Echeria* by *P. Leonidas*, male and female, and by *P. Merope* (var. *Cenea*), female, and *Pseudacræa Tarquinia* and *Diadema Mima*. *D. Ochlea* has been supposed to support a likeness to *P. Pylades* and *Diadema Anthedon*. Of all these instances, the first named and mentioned by Mr. Spiller is specially noticeable, as not only the normal types but the varieties—(*a*) with suffused apex of fore wing and white hind-wings, and (*b*) with a central white spot in the hind wings—are all mimicked by the female *D. Misippus*. They are both open-ground and grass-haunting insects. *D. Echeria* and *D. Chrysippus* are both very abundant, and the larvæ are frequent, of which those of the latter do not vary; but those of the former are differently coloured, the female being brighter and more strongly marked than the male larva.

The tentacles or fleshy filaments on the family of the *Danaidæ* are very unmistakable as a mark of the order in the larval, as are the gilt marks in the pupal, state. *D. Ochlea* I do not know in its larval state. It is essentially a wood-haunting butterfly, and when it occurs is generally numerous; but it has a habit of lying dormant two or three seasons, and then appearing in large numbers.

ACRÆIDÆ.

The *Acræidæ*, as Mr. Spiller has sketched them very truthfully, need no remark, except to notice their transformations; of these nearly a dozen, I believe, have been worked out. For myself, I have bred *A. Lycia*, *A. serena*, *A. Petræa*, *A. violarum*, *A. Natalica* (var. *Hypatia*), *A. Zetes*, *A. Eponina* (*Cynthea*), and *A. Esebria* (*Protea*); and I believe *A. punctatissima* and *A. Horta* are known by Mr. Trimen, having been bred by Mrs. Barber in the "Old Colony." The larvæ approach the spiny Nymphalids in type, but the head is not spined; each segment, however, carries an apportioned number; the body is cylindrical and naked; the colouring generally pale. The spines of *A. violarum* are very long, colourless and transparent, and give a very pleasing appearance. The pupa also of this species has six flaccid tentacles, long and recurved, approaching those of the *A. Phalanta* of Natal, but longer and not so brightly coloured.

The *Acræidæ*, like the *Danaidæ*, have "followers." *Atella Zetes* is mimicked by the nymphalideous *Pseudacræa Boisduvalii*, and *A. Aganice* by *P. Tarquinia*. As Mr. Spiller does not mention these *Pseudacrææ* in his list of captures, I am inclined to believe that it is a good indication how close the resemblance is, for neither of them are rare. *P. Tarquinia* is so like *A. Aganice* when with it on the wing (and they are continually together), that, till you know the exact point to watch, you would pass it over as the latter. Moreover, *A. Aganice*, *A. Zetes*, *P. Boisduvalii*, and *P. Tarquinia* are all high flyers, and not easy on that account to investigate closely. *Acræa punctatissima* is abundant farther up country, and is found in open grass, which accounts for Mr. Spiller's non-success. It is interesting because it is mimicked by a day-flying moth; at least, I suppose, the moth imitates the butterfly, it being the rarer of the two. This is not the only example of such mimicry which I shall deal with in my remarks on the day-flying Heterocera.

Newton-le-Willows, Lancashire.

(To be continued.)

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Argynnis Lathonia near Dover. — *Argynnis Lathonia* has occurred in unusual numbers in the Dover district this season. I append a list of those which have come under my notice. Unfortunately while they were out there was a prevalence of high winds, and many escaped the net in consequence. They are difficult to see on the wing, and more so to mark down, for they have a habit of dropping suddenly from their flight, much the same as a sky lark. The following are placed in their order of capture:—September 7th, one taken by Mr. Gray, and one by a young collector. September 9th, two by Mr. Gray, and two by Mr. Bailey; all taken before one o'clock in the day; also one each fell to Mr. George Gray and Mr. Bailey during the afternoon. On the 10th Messrs. Gray and Bailey each took one specimen. Again, Mr. Gray took one on the 11th, and two were captured by Mr. F. I. Hanbury. On the 13th September Mr. George Gray took another, and purchased one from a boy who had that day captured it. Lastly, Mr. Gray took a single specimen on the 14th September, and subsequently purchased two, but without record of dates of capture. It will be seen that the total captures amount to eighteen specimens. — Sydney Webb; 3, Godwyne Road, Dover.

VANESSA ANTIOPA NEAR YORK.—A very fair specimen of this species was taken in Houghton's Garden, Holgate, on September 17th, and another seen in Messrs. Backhouse's Nursery a few days later.—W. PREST; 13, Holgate Road, York.

VANESSA ANTIOPA IN LANCASHIRE.—I beg to record the capture of this species in this district. On September 2nd a boy caught a specimen at Whittle Hill, Birch, near Heywood. As far as I can get to know it has never occurred about here before. The specimen is now in my possession.—J. W. BENTLEY; Stakehill Works, Castleton, near Manchester, October 1, 1880.

VANESSA ANTIOPA IN KENT.—*Vanessa Antiopa* seems to have occurred in several localities in Kent. At Gravesend, Headcorn, and Herne Bay its appearance has been noted, and to these I can add two more, *viz.*, Knowlton and Fredville, in the neighbourhood of Wingham. These two instances were in the first week of September.—W. OXENDEN HAMMOND; St. Alban's Court, near Wingham, Sept. 7, 1880.

VANESSA ANTIOPA, &c., IN ESSEX.—On the 27th August last I had the good fortune to capture a specimen of this butterfly whilst it was flying round a pond at Ilford. Not having a net with me at the time it received some rough and unentomological treatment, which resulted in its losing not a few of its scales; otherwise it is in perfect condition. From the same neighbourhood I also had brought to me two larvæ of *Acherontia Atropos*, which are now in pupæ.—GEORGE WATKINS; Great Gales, Woodford Bridge, Essex, October 15, 1880.

VANESSA ANTIOPA.—In addition to the notices in this Journal of the occurrence of *Vanessa Antiopa* during the past autumn, the following records have been taken from the 'Field,' and may have been overlooked by some of our readers:—August 17th, one seen at Tonbridge, Kent, by Miss E. C. Thomson; August 19th, one taken in Gravesend by Mr. C. M. Woodford; August 26th, by Mr. S. McCaul, at sugar at Herne Bay; August 24th, by Mr. A. E. Stuart, at Headcorn; August 30th, at Chudleigh, by Mr. John Ellis. During the first week in September the following were observed or taken:—One each at Knowlton and Redville, Kent, by Mr. Oxenden Hammond; two at Ardington, Berks, by Mr. C. L. Lindsay; one at Eastbourne, by Mr. A. Walker; and, as though to wind up the season, Mr. F. Russell picked up a fine specimen, evidently benumbed by the cold, in a street in Greenwich on October 12th. In 'Land and Water' there is only one record of a capture this season, by Mr. R. Marken, at Combe, near Honiton, Devon. In 'Science Gossip' for October, Mr. Collis Willmott gives a lively account of seeing a couple of *Vanessa Antiopa* in copulâ while flying through the air, but as he gives neither date nor locality the record may refer to another season. —JOHN T. CARRINGTON; October 22, 1880.

THECLA W-ALBUM.—This butterfly appeared in plenty in one particular spot in July, 1873, 1874, 1876, 1877; and in 1875 it literally swarmed on some elm trees. In 1878, 1879 and 1880 it has totally disappeared. This instance proves that an insect will disappear from other causes than slaughter.—W. H. SCOTT; Eastwood Villas, Humberstone Road, Leicester.

APATURA IRIS *var.* ILIA.—While collecting in Abbot's Wood, Sussex, during the last week in July, I captured a variety of *Iris* with the usual white band on the under wings absent, and the spots on the upper wings smaller, than in the normal type. Unfortunately the specimen was very much shattered, so much so as to be worthless. *A. Iris* was plentiful, but difficult to obtain, owing to the dense undergrowth. Three specimens only fell to my share, all females. Other butterflies were not so common as usual.—J. A. COOPER; 32, Bingfield Street, Barnesbury, N.

VARIETY OF POLYOMMATUS PHLÆAS.—I recently captured near Shanklin a variety of *P. Phlæas*, with the copper colouring superseded by silvery white.—J. H. LEECH; Shanklin, Oct. 9, 1880.

PYRAMEIS HUNTERA.—Referring to Mr. P. H. Gosse's "Notes on the Butterflies of Paraguay, &c." (Entom. xiii. 198), I would remark that *Pyrameis Huntera* (the scarce painted lady of this country) is not uncommon in Canada, where several years since I took some very fine specimens of this exquisitely marked insect on clover (*Trifolium*), in a field near the plains of Abraham, Quebec, the site of the famous battle between Wolfe and Montcalm. I also captured similar specimens in the suburbs of Montreal, on cotton thistle (*Onopordum acanthium*), and smaller and more soberly coloured specimens (probably of the second brood) on a grassy bank at the base of Mount Royal, on the northern side of the same city.—G. J. GRAPES; 2, Pownall Crescent, Colchester, September 13, 1880.

CHŒROCAMPA CELERIO IN KIRKCUDBRIGHTSHIRE.—On the 8th inst. the gardener at Edenbank, near here, handed me a match-box, with the remark that it contained a big moth that he had taken out of a "speedurt's waab." Judge of my pleasurable surprise when I found it was a very fair specimen of *C. celerio!* It was so recently dead as not to require relaxing. On going to see the place where it was got I was shown a mass of spiders' webs just above the greenhouse stokehole-fire. I have no doubt it had flown to the light. From the same spot, three years ago, I obtained a *Sphinx convolvuli*, which had doubtless been attracted in the same manner. Possibly the unusually fine warm summer we have had here may have something to do with the occurrence of such a rare species as *C. celerio*. But I suppose such queries as "Where had it been bred?" and "How had it wandered so far north?" cannot be answered.—ROBERT SERVICE; Corberry Hill, Maxwelltown, N.B., October 18, 1880.

CHŒROCAMPA CELERIO IN OLDHAM.—I have just obtained a specimen of this rare insect, taken on September 14th, at rest on some pig-iron at an iron-foundry.—JOHN TAYLOR; 228, Chadderton Road, Oldham, October 9, 1880.

CHŒROCAMPA CELERIO AT BURTON.—On the 6th inst. I had a specimen of *Chœrocampa celerio* brought to me in very fair condition; it was found in Mr. Bass's brewery-yard.—G. BAKER; Alnis Villa, Ashby Road, Burton-on-Trent, October 12, 1880.

CHŒROCAMPA CELERIO AT SHEERNESS.—I captured a fine and perfect specimen of *Chœrocampa celerio* at Sheerness-on-Sea, on October 10th.—J. H. DARLEY; 19, Constantia Terrace, Marine Town, Sheerness-on-Sea, Oct. 14, 1880.

CHŒROCAMPA CELERIO, &c., AT CHICHESTER.—That the past season has not been one remarkably favourable to the lepidopterist will, I expect, be the *dictum* of most collectors. In this neighbourhood the *Papilionidæ* were very poorly represented, except by the two species of *Pieris*, *P. brassicæ* and *P. rapæ*, which, alike in the larval and perfect states, never, I should say, appeared in larger numbers. *Colias Edusa*, though the clover was exceptionally luxuriant, was to be met with very sparingly, and *Vanessa cardui* was far less abundant than last year. I can, however, record at least one rarity amongst the *Sphingidæ*—a fine specimen of *Chærocampa celerio,* which flew into the bed-room, and was captured by Mr. Mortimer Hooper on October 1st. It is now on my setting-board. *Cidaria procellata* was one of the commonest Geometers. *Seledosema plumaria* and *Cleora glabraria* were taken; the latter by Mr. J. Purchase, at Kingly Vale, a short distance from the town. This is quite a new locality, I believe, for this almost exclusively New Forest species. Sugar has attracted but few insects, the best being *Cosmia affinis, Agrotis puta, A. saucia, Catocala nupta,* and *Xylina petrificata;* these were from our gardens.—JOSEPH ANDERSON, jun.; Chichester.

CHŒROCAMPA CELERIO IN THE ISLE OF WIGHT.—A specimen of *C. celerio* was taken here on October 8th by a small boy, who picked it up in the street. Unfortunately when it came to me it was in a very battered condition.—J. H. LEECH; St. Paul's Vicarage, Shanklin, Isle of Wight, Oct. 9, 1880.

CHŒROCAMPA ELPENOR, VAR. OF LARVA.—I may add a notice of a form of the larva of *C. elpenor* which is new to myself, though possibly not to others. The larva was found at Sundridge, in Kent, last autumn (I think in August, 1879), and sent to me. It fed up on vine, and changed to a pupa towards the end of the month. Description:—Larva light brown; on 5th and 6th segments a velvet-black ocellus, with a kidney-shaped whitish spot within the black; on the 6th, 7th, 8th, 9th, and 10th segments an oblique lateral stripe of lilac and white, similar to those in the larva of *S. ligustri,* but shorter; horn very short, but not so short as in *C. porcellus.* I had hoped that *C. celerio* would appear, but in August of this year (1880) the pupa having suddenly become very dark in colour, and no imago emerging, after waiting till I was satisfied that the pupa was dead, I broke through the outer skin, and found a perfectly-formed imago of *C. elpenor,* which had died apparently at the very point of maturity. I am well aware of the green form of *C. elpenor* larva, but the lilac stripes were quite new to me.—W. O. HAMMOND; St. Alban's Court, near Wingham, October 6, 1880.

ACHERONTIA ATROPOS.—The larvæ of this handsome moth have occurred in some numbers this season in Essex, especially in the neighbourhood of Ilford and Stratford. Among those who have been most fortunate in obtaining these larvæ and pupæ is Mr. Rowland.—Thos. Eedle.

Deilephila livornica at Bournemouth.—On the 27th of September last a specimen of this rare moth was taken at rest from the trunk of an apple tree in a garden in this town. The lad who found it, knowing nothing of moths, carried it alive in a glass to Mr. White, a young friend of mine, who is an ardent collector. Mr. White, after having set it, brought it to me for identification, and I was pleased to be able to inform him that he was the fortunate possessor of an undoubted specimen of *D. livornica*. It is rather remarkable that a specimen of this moth was found last year at rest on a pear tree by a little boy in a garden in Bournemouth, and near the same locality.—W. M'Rae; Westbourne House, Bournemouth, Oct. 9, 1880.

Catocala fraxini.—I had the pleasure of taking this fine insect at sugar, near this town, on 27th September last. The specimen is in fair condition, but had evidently been some time on the wing.—J. H. A. Jenner; 4, East St., Lewes, Oct. 19, 1880.

Deiopeia pulchella in Lincolnshire.—I beg to record the capture, by me, of a perfect specimen of *Deiopeia pulchella* in a meadow on the coast not far from here, on August 21st. Being only a young entomologist I was not aware of the rarity of my capture until a week since.—Annie Dows; Boston, Lincolnshire, October 11, 1880.

Deiopeia pulchella at Folkestone.—A fine specimen of this scarce species was captured by my sister on a grass-border in Augusta Gardens, Folkestone, on October 8th. It was evident that it had very recently emerged from the pupa. I hear of another specimen having been taken near Dover.—A. H. Melvill; St. John's College, Oxford, October 22, 1880.

Sesia culiciformis near York.—In the middle of last June, when walking on the outside of Sandburn Wood at night, I gave a look with my lantern at the flowers of the mountain ash growing in the hedge, and, to my surprise and delight, I saw and quickly boxed a very fine specimen of this species. I beat another from a birch tree during another day. This is the first time I have taken this species near York after collecting here for over twenty years.—W. Prest; 19, Holgate Road, York.

Capture of Stauropus fagi near Dulwich.—On June 21st last I was lucky enough to capture a fine male *S. fagi* close to Dulwich College. The moth was at rest on a street lamp. I believe this is a new locality, and probably the nearest to London, for this rare moth. I may remark that there are comparatively few birch trees in the neighbourhood.—H. B. Pim; Leaside, Kingswood Road, Upper Norwood, Sept. 30, 1880.

Acronycta alni near Market Harborough.—At the beginning of August I took a larva of *Acronycta alni* at Gumley, near Market Harborough, off wych-elm. It refused, however, to feed on the leaves of that tree, and had probably got upon the branch accidentally. *A. alni* appears to feed on many kinds of leaves, but in this case it kept up its name by taking to alder.—W. W. Fowler; The School House, Lincoln.

Lithosia quadra at Eastbourne.—In the October 'Entomologist' I observe Mr. Williams makes a note of having taken *Lithosia quadra* at Folkestone. I may mention that while sugaring near Eastbourne, in the early part of September, I captured two fine specimens, one male and one female.—James Tearoe.

Rare Noctuina.—I have just had three capital additions to my collection of *Noctuina*, viz., *Micra ostrina*, taken by a friend on the Dorset coast, and another by Mr. Rogers in the Isle of Wight; also *Noctua flammatra* and *Micra parva*, likewise taken by Mr. Rogers at Freshwater, the former in July and the latter in August.—C. W. Dale; Glanville's Wootton, October 5, 1880.

Note on the Larvæ of Cleora glabraria.—At p. 207 of the 'Entomologist' for the present year I mentioned that all the larvæ of *Cleora glabraria* I had taken in the New Forest this year had been destroyed by ichneumons. The appearance of these larvæ, after the parasites had spun their cocoons, was precisely the same as that of *Boarmia repandata*, so excellently delineated by Mr. G. C. Bignell, in the 'Entomologist' for October, p. 244. I found that if the larvæ were removed from the cocoons before all the parasites had emerged, they would find their way back to the mass of cocoons and seat themselves again in the same singular manner. At present none of the ichneumons have appeared in the perfect state.—J. Jenner Weir; 6, Haddo Villas, Blackheath, London, S.E.

Variety of Hemerophila abruptaria.—On the 20th June last I captured a perfectly black variety of the above insect. It was exhibited at the last meeting of the Entomological Society. Was not the insect very late in its appearance? — A. Sidney Olliff; 36, Mornington Road, Regent's Park, Oct. 11, 1880.

Description of the Larva of Penthina postremana.—Not having seen anything written on this larva, except a rough note by my old friend J. B. Hodgkinson in an earlier number of the 'Entomologist,' I enclose for insertion the following description:—Length nearly half an inch; form slightly appressed and attenuate to anus. Colour light yellowish drab, running into bright canary-yellow as it proceeds to the anus. Head narrow, dark, horn-like, glabrous. Corslet rather narrow, of the same colour and texture; 4th to 7th segments constricted, and 3rd and 4th segments puffed out laterally from 7th segment. The attenuation to the anus is pronounced, the anal point being pointed. Feet hardly perceptible, spinous. Feeds in the two lower divisions of its food-plant, and moves freely and quickly up or down; it appears to rest in a cavity it has made in the crown of its food-plant, *Impatiens noli-me-tangere* (the touch-me-not), when full-fed. —C. S. Gregson; Rose Bank, Fletcher Grove, Stanley, Liverpool, October 20, 1880.

Pterophorus trigonodactylus.—I have pleasure in recording the occurrence of this species amongst coltsfoot on Hackney Marshes. When searching for some mallow on the banks of the barge river, about half a mile from Lea Bridge, in June, I observed it flying in some numbers. Having but thirteen boxes with me I was unable to capture more, but I could have taken a much larger number had I been better provided. The second brood was equally abundant on Saturday, 4th September.—W. Machin; 22, Argyle Road, Carlton Square, E., September 10, 1880.

Diasemia ramburialis.—While collecting on September 13th, near Dover, in company with my friend Mr. W. P. Weston, I obtained a specimen of this rarity by beating *Eupatorium cannabinum* (hemp agrimony).—Reginald E. Salwey; Putney.

Micro-Lepidoptera near Dover.—During the past season I have met with the following Micro-Lepidoptera in this district. I did not work especially for any of the species hereafter mentioned, being occupied with working out other entomological problems. Had I had more time to devote to them I might have taken more than I have, and probably other species:—*Sericoris lacunana* var. *herbana*, *Mixodia Ratzburghiana*, *Pædisca occultana*, *Eupœcilia udana*, *E. flaviciliana*, *E. ruficillana*, *Cochylis gigantana*, *Depressaria rotundella*, *Yponomeuta evonymella*, *Cedestis farinatella*, *Gracillaria ononiella* (one, which afterwards escaped), *Coleophora conyzæ*, *Batrachedra pinicolella*, and *Chauliodus illigerella*.—Sydney Webb; 3, Godwyne Road, Dover, October 17, 1880.

Dorthesia chiton in Ireland.—When in Greenland, during the summer of 1875, and searching for the "neat little snail," *Vitrina angelicæ*, Bk. & Möll., at the base of a cliff in Englishman's Bay, Disco, amongst a luxuriant growth of *Platanthera hyperborea*, *Luzula spadicea*, and *Polystichum lonchitis*, my attention was attracted to a number of small scaly insects which were adhering to the bases of the stems and dead leaves, amongst which the plants were growing. These proved to be the interesting and curious *Coccus cataphracta* of Shaw, to which the name of *Dorthesia urticæ*, Linn., has been recently bestowed, and which is enumerated in the Appendix to Nares' 'Polar Voyage' as *Dorthesia chiton*, Zett. It was with much surprise and pleasure that, soon after my return from the Arctic Regions, while I was again hunting for small land-shells, this time at the roots of ivy and London-pride saxifrage (*Saxifraga umbrosa*), in a rocky glen at Glenalla, in the County Donegal, I again came upon a very numerous colony of the *Dorthesia*, which I have observed to continue in the same spot for the last three years. More recently I have observed this remarkable insect amongst moss and dead leaves in the "Devil's Glen," County Wicklow. Not feeling sure of the name I applied to Dr. F. Buchanan White, of Perth, who has lately described a Scottish species under the name of *Orthezia Signoreti* (see Scot. Nat. iv. 161), and he kindly informed me that he believes mine is the same species; but I find, from information kindly supplied by Mr. J. W. Douglas, that Signoret, the best authority on the subject, refers the three first names to one single species, in which probably *D. Signoreti* itself would be included, so that I am content with the expressive name of *D. chiton*, Zett., under which I first made acquaintance with the insect.—Henry Chichester Hart; Royal Dublin Society, Kildare Street, Dublin, Oct. 21, 1880.

REVIEWS.

The Transactions of the Yorkshire Naturalists' Union. Parts 1—3.
London: W. Satchell & Co. 1878—80.

The first work of a local Natural-History Society is to mutually educate its members sufficiently to make them all able to take a part in working out the flora and fauna of the district or region encompassed by its workings. Lectures, papers read, scientific debates, conversazioni, field meetings, and individual collecting, are all means to an end. This end is the publication of a local flora and fauna, and the aim is of course to make it as exhaustive as possible. The Yorkshire Naturalists' Union has arrived at this point, and commenced the publication of its local catalogues of animals and plants in 1878. The three parts now published contain much valuable information in all the series treated of; why the part (3) issued to subscribers for 1878 has only just appeared does not rest with us to enquire. The Union consists of nearly thirty societies, and its publications are arranged in six series, *viz.*:—general, vertebrate zoology, conchology, entomology, botany, and geology. The first and last have not yet made a sign, but all the others record good work; it is however with section D—*Articulata*—only that we are concerned. The Lepidoptera are under the care of Messrs. Porritt (Macro) and Prest (Micro); very able reports have resulted. However, amongst the Macro-Lepidoptera only one additional species to the county is recorded; this was *Carsia imbutata*, taken by Mr. Smethurst on Goole Moor in 1877; the last two years have produced nothing new. This list of Yorkshire species has not yet appeared, so we have no opportunity of judging how complete it may be considered. This part of the report still contains much interesting matter in its minor details, as might reasonably be expected from so large a body of workers. Mr. Mosley contributes a short report on Yorkshire *Psyllidæ;* also a very meagre list of Diptera. Certainly the best report in the section is that of Mr. Roebuck, who, later, had the co-operation of Mr. Bairstow, on Yorkshire Hymenoptera; the forty-eight pages occupied, not only include a very creditable list of species, but some most valuable remarks on the generalities of each family. The reports of the entomological section altogether run to eighty pages. These

Transactions show careful editing, and are well printed on good paper. We congratulate the Union on its publication, and can but hope for a continuance of such healthy work so well turned out.

Praktische Insekten-Kunde. By Prof. Dr. E. L. TASCHENBERG.
Bremen: Heinsius. 1879—80.

FROM our previous knowledge of Dr. Taschenberg's writings, when this work was announced we had but little doubt that a useful volume would be produced. Our expectations have been more than realised, and we now have a very valuable, comprehensive Manual of Entomology. It is also particularly well illustrated with 330 original woodcuts. These, as might be expected, are far from being of equal merit, but of many we can safely say that they are the most life-like entomological figures we ever saw; the position and surroundings of many of the Coleoptera, Hymenoptera, and Lepidoptera, in their various states, are particularly natural, as well as being artistic; of the Diptera, on the other hand, several of the figures are complete failures.

Professor Taschenberg gives first a short general introduction; then the structure, anatomy, metamorphosis and systematic arrangement of the Hexapods are fully considered. Each of the seven orders of insects are then separately treated of. The general structure, metamorphosis and literature of the order, with the methods of capture and preservation are first given; then a synopsis of the families, followed by the general economy of the genera and well illustrated life-histories of the most characteristic or specially noxious species. Tabular arrangements of the genera and occasionally of the species are frequent, —a great assistance to beginners.

The Neuroptera are dismissed in seven pages of generalities and four pages of specialities, *Chrysopa* and *Panorpa* only claiming attention. In the Orthoptera, Taschenberg includes the *Thripidæ*, *Termitidæ*, *Psocidæ*, *Perlidæ*, *Ephemeridæ*, *Odonata*, *Collembola*, *Thysanura*, and *Mallophaga*, in addition to those families generally contained in the order. In this he follows Erichson, but the arrangement has not been generally accepted. After the Hemiptera (Rhynchota) we have an eighth order containing the apterous parasites (*Anoplura*, *Mallophaga*, *Pulicidæ*, &c.), apparently established for practical convenience. Then certain Acaridea, Araneidea, Myriopods, Isopods, Annelids, and Mollusca, are more or less cursorily treated of. These are specially noted as noxious, but *not* insects.

The whole work is published in five parts, each of which can be purchased separately:—(1) The introduction, containing forty-six woodcuts, price 4*s.*; (2) the Coleoptera and Hymenoptera, containing ninety-eight woodcuts, price 6*s.*; (3) the Lepidoptera, containing eighty-three woodcuts, price 5*s.*; (4) the Diptera, Neuroptera, and Orthoptera, containing fifty-six woodcuts, price 4*s.*; (5) the Hemiptera, Mallophaga, Acaridea, &c., containing forty-three woodcuts, price 5*s.*;—complete, 23*s.* We hardly think the last two parts maintain the high standard of the first three. Each part has a separate index, and a "general-register" is given in part five. This is followed by a list of plants and objects, with the insects that attack them,—often likely to prove a great help to the practical man.

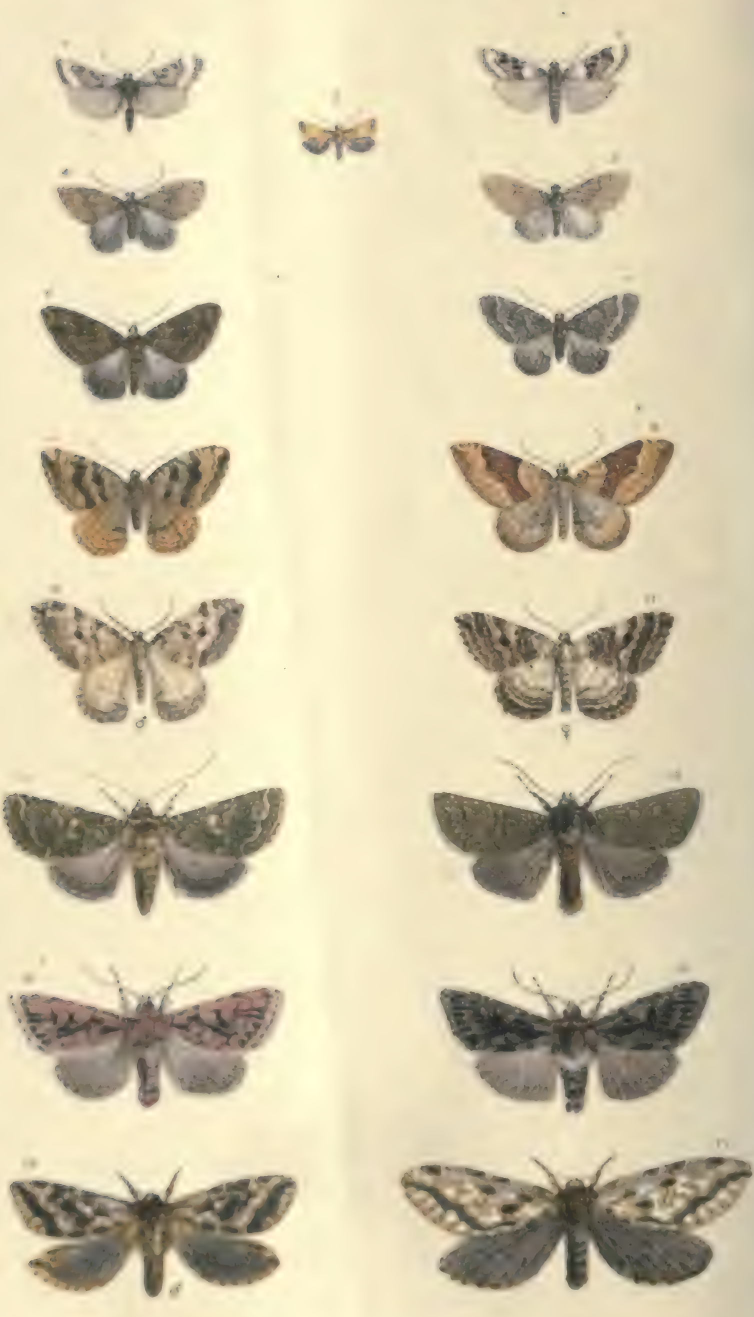
Failing a new edition of Westwood's 'Introduction' collated with Curtis's 'Farm Insects,' both brought well up to date, we can but wish one of two things—either that Professor Taschenberg's book had appeared in English, or that all British entomologists were sufficiently good German scholars to read it.

Illustrations of Typical Specimens of Lepidoptera Heterocera in the Collection of the British Museum. Part IV.—North-American Tortricidæ. By Lord WALSINGHAM. London: printed by order of the Trustees, 1879. 4to.

WE have before us a copy of this work issued by the Trustees of the British Museum, who are to be congratulated upon being the means of showing the world a portion of the valuable work done in North America by Lord Walsingham in the years 1871 and 1872. In addition to describing a great number of new species captured during his collecting tour in the Western States of North America during those years, Lord Walsingham has, in this book, redescribed such of the late Mr. Francis Walker's types in the British Museum as were imperfectly described. Those who study the relation of a particular group of Lepidoptera from all parts of the world will hail this contribution to the Natural History of the *Tortricidæ* with more than pleasure. The seventeen coloured plates are fully described in the eighty-four pages of letterpress, and form an interesting subject for examination by the British lepidopterist, who will find a striking similarity between some of the species taken in so remote a place as California and those from our own collecting grounds.

In adopting for this work Heinemann's system of classification as used in his 'Schmetterlinge Deutschlands und der Schweiz,' Lord Walsingham says:—"Many systems of generic subdivision have been suggested for this difficult group, but all appear to have been founded upon a study of European species only. So far as I have been able to judge, none of these various systems are sufficiently perfect and natural to facilitate the arrangement of a cosmopolitan collection. It is very desirable that some comprehensive system should be devised, but for this purpose a very careful study of specimens from all parts of the world is obviously necessary, and it may be long before such a work can be successfully undertaken. Until this has been done, any arrangement of this group of insects must, I think, be considered in part at least provisional." In this we quite agree, for even the limited fauna, so far as regards the *Tortricidæ*, of these islands is not by any means satisfactory in the scientific arrangement generally adopted.

"Our American Cousins" will find the work under consideration a fine addition to the entomological literature of their country; but we cannot help wishing that the same author and the same publishers would undertake as good and well illustrated a Natural History of the British Tortrices, or better still if it extended to the known species of the Palæarctic region. Such a work, we need hardly point out, would be a great boon to those of our readers who study this obscure group of Lepidoptera, and we have no doubt would induce many to work who now shirk the apparent difficulties before them. It is a source of gratification to find the public money expended upon such work as that before us, and we should thank the Trustees for the issue of the book above alluded to, which it would be unreasonable to expect from private enterprise. Nevertheless we cannot help thinking it would be a still greater gratification to British entomologists to find the issue of a similar list, of the British Museum series, more closely connected with our own fauna. A work of this character would lead to a better knowledge of, and probably a large addition to, the Tortrices known to occur in these islands.



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THE MACRO-LEPIDOPTERA OF THE SHETLAND ISLES.

By J. JENNER WEIR, F.L.S., F.Z.S.

(WITH A COLOURED PLATE.)

(Concluded from p. 251.)

Hepialus velleda.—The Shetland specimens are very rich in colour in most instances, although amongst them some are much paler than the normal colour of the species; the range of varieties is not nearly so great as in *H. humuli.* A male and female are figured in plate 4.

Nemeophila plantaginis.—The variety *Hospita* of this insect apparently does not occur in Shetland, but some of those captured exhibit a coloration exactly the reverse of *Hospita,* which has the ground colour of the under wings almost white, and the upper wings a very light yellow; those taken by Mr. Meek's collector have the upper wings of a light yellow, and the lower much more darkly coloured.

Agrotis porphyrea.—The Shetland specimens are much larger than any I have seen before, and some are distinguished by a total absence of purple on the wings.

Noctua festiva var. *conflua.*—This insect varies very much; some resemble the ordinary varieties of *conflua,* others are in coloration more like *N. Dahlii,* and others are very like *N. brunnea*; all are darker than the normal *N. festiva.* Some have a hoary appearance, and indeed present such singular differences that I do not doubt if the more remarkable aberrations were examined separately they would, in the absence of links, be regarded as distinct species.

Pachnobia hyperborea.—This usually very variable insect is not so variable in Shetland as in Scotland; two of the extreme varieties are figured. Some present a rich red ground colour, in others the prevailing hue is slaty grey.

Dianthœcia conspersa.—All the specimens are very much darker than the ordinary colour of the species, and some are almost black and quite devoid of markings, resembling very much, in their dull leaden hue, *D. cæsia.*

Dasypolia templi.—Only three specimens were captured; two of them are very much lighter than the usual colour of the species.

Aplecta occulta.—It is singular that the specimens of this insect are quite as light in colour as the usual southern type, none being dark like those taken in Scotland.

Hadena adusta.—The specimens of this insect are remarkably rich in colour, and with the markings more defined than usual.

Larentia didymata.—The specimens of this insect are darker than usual.

Emmelesia albulata.—None of the specimens collected resemble the normal type. The prevailing colour is difficult to define; to my eyes it appears to be a luteous lead-colour. Some of the specimens are almost without markings. I propose for this insect the subspecific name of *Emmelesia albulata* var. *Thules.*

Eupithecia venosata.—The specimens are of a dull lead-colour with the markings almost indistinguishable owing to the darkness of the ground colour; they resemble those from Ireland, but are much darker.

Coremia munitata.—The specimens taken are of a very lovely purple or vinous colour, far more beautiful than any I have seen before; there is an opaque look about them, and the markings are very sharply defined.

Melanippe montanata.—The specimens taken are tolerably constant in coloration, but they vary very much from the type of the species. It has been thought desirable to figure both sexes of this charming insular variety. It will be seen that the median band is broken up into a series of bandlets, and the under wings are very much streaked with narrow lines. I regard these insects as being among the most beautiful obtained. I propose for them the subspecific name of *Melanippe montanata* var. *Shetlandica.*

Camptogramma bilineata.—The specimens taken are of a pale straw-colour, but, like the type, they vary much in the amount of black suffused over the fore wings.

Melanippe fluctuata.—Only one specimen was taken. This is almost black, with the usual markings very faintly indicated.

It will be gathered from these descriptions that many of the species are darker and duller than the southern forms, whilst, on the contrary, several are lighter; amongst the former may be noticed *Dianthœcia conspersa*, *Melanippe fluctuata*, and *Eupithecia venosata;* and amongst the latter, *Dasypolia templi*, *Aplecta occulta*, and *Camptogramma bilineata.* This appears to me a singular and inexplicable fact.

I think enough has been written to enable all to judge of the value of Mr. Meek's contribution to a knowledge of the Macro-Lepidoptera of the Shetlands; and I do not doubt that he will obtain, both amongst British and Continental entomologists, the credit he so richly deserves.

6, Haddo Villas, Blackheath, London, S.E., October, 1880.

THE MICRO-LEPIDOPTERA OF THE SHETLAND ISLES.

BY HOWARD VAUGHAN.

THE Micro-Lepidoptera observed by Mr. Meek's collector during his sojourn in the Shetland Isles numbered only eighteen species. We are, however, compensated to some extent for this paucity by the addition to our lists of a new *Eupœcilia*, for which I have proposed the name *E. Thuleana;* and also by the beautiful variation exhibited by some of the other species. All, with the exception of *Tinea rusticella*, were obtained from the "Mainland," as the largest island is called. *T. rusticella* occurred only in the Isle of Burra, upon which *Catoptria ulicetana* was also found.

The following were the species captured:—

PYRALIDINA.

Scoparia ambigualis.—One specimen.

S. alpina.—The two beautiful varieties are delineated in plate 4, figs. 1, 2.

Crambus pratellus.

C. culmellus.—Scarce, and do not present any variation from the type.

TORTRICES.

Sericoris littoralis.—These were of a rich brown, and not unlike some of the Irish and Manx examples I have seen.

Mixodia Schulziana.—Brightly coloured, but somewhat smaller than the ordinary Scotch form.

Cnephasia musculana.—These are very pretty, and a striking contrast to our ordinary form. The ground colour is brighter and more silvery, and the darker markings are more intense. In some examples the fascia is broken.

Bactra lanceolana.

Phoxopteryx unguicana.

Pamplusia monticolana.—This and the two preceding species do not display any divergence from the type.

Dicrorampha tanacetana.—The ground colour is somewhat redder than the English forms.

Catoptria ulicetana.—More variegated than our English specimens, but not so brightly marked as those from some of the Scotch localities.

Argyrolepia cnicana.—One large and richly-coloured specimen only was captured.

Eupœcilia Thuleana, n. s. (fig. 3).—A series of this interesting insect, which differs entirely from any of our hitherto known species, was obtained. It is described at page 293, in this number of the 'Entomologist.'

Aphelia pratana.—Only four or five examples were obtained. One of these is a straw-coloured variety, and displays the dark markings very distinctly. The others do not differ from the Scotch specimens I have seen.

TINEÆ.

Tinea rusticella.—Several.

Gelechia ericetella.—A pretty light form.

Glyphipteryx cladiella.—Dr. Wocke gives England as the only locality for this species. I am indebted to Mr. Sydney Webb for identifying the specimens.

55, Lincoln's Inn Fields, October 10, 1880.

EUPŒCILIA THULEANA: A MICRO-LEPIDOPTERON NEW TO SCIENCE.

EXPANSE 5½ to 6 lines. Head and palpi straw-coloured. Thorax and patagia somewhat darker and interspersed with gray. Fore wings glossy, tawny fuscous. An elbowed whitish line extends from the costa at the junction of the middle and outer thirds to the anal angle. Apex and hind margin dark brown. From the hind margin four dark dashes run towards the elbowed line; fringes fulvous. Costa straight, and apex pointed. Hind wings dark gray, paler towards the base; fringes whitish gray. The sexes are similar, and the species is constant in colour and markings. The wings are rather more pointed than shown in plate 4, fig. 3.

This distinct and interesting addition was discovered by Mr. Meek's collector in the month of June last, in the Shetland Isles. It inhabits the rocky coast of the island called the "Mainland," and flies along the face of the cliffs in the most inaccessible places, and consequently its capture is attended with great difficulty and danger.

I should place *E. Thuleana* between *E. affinitana* and *E. flaviciliana* in Wilkinson's arrangement of the British Tortrices.

HOWARD VAUGHAN.

55, Lincoln's Inn Fields, October 10, 1880.

LEPIDOPTERA OF THE SHETLAND ISLES.

DESCRIPTION OF PLATES.

PLATE 3.

Figs. 1, 3, 5, 7 & 10.—Males of *Hepialus humuli* var. *Hethlandica*, with dark posterior wings. Figs. 7 & 10 represent males with the brown anterior wings of the females.

Figs. 2, 4, 6 & 8.—Males with light posterior wings.

Figs. 9, 11 & 12.—Females of *Hepialus humuli* var. *Hethlandica*.

PLATE 4.

Figs. 1, 2.—*Scoparia alpina*, male and female; varieties.

Fig. 3.—*Eupœcilia Thuleana*, Vaughan.

Figs. 4, 5.—*Emmelesia albulata* var. *Thules*, Weir.

Fig. 6.—*Melanippe fluctuata*.

Fig. 7.—*Eupithecia venosata*.

Fig. 8.—*Camptogramma bilineata*.

Fig. 9.—*Coremia munitata*.

Figs. 10, 11.—*Melanippe montanata* var. *Shetlandica*, Weir.

Figs. 12, 13.—*Dianthœcia conspersa*.

Figs. 14, 15.—*Pachnobia hyperborea*.

Figs. 16, 17.—*Hepialus velleda*, male and female.

THE TORTRICES OF SURREY, KENT, AND SUSSEX.

By Walter P. Weston.

(Concluded from p. 272.)

Xanthosetia hamana, Linn.—Common throughout, the imago appearing from June to August amongst thistles. The perfect insects vary considerably in colour and markings.

X. Zoegana, Linn.—Generally distributed, but more local than the preceding species. The imago occurs from May to September, but I am inclined to believe there are two separate broods, as the August specimens are richer in colour than the spring ones. According to Wilkinson the larva feeds in the roots of *Scabiosa columbaria*.

Chrosis tesserana, Treit. Common throughout, among broken ground and mixed herbage. The imago is to be met with from May to August, and flies freely in the hot sunshine, as well as at dusk. It is very variable both as to ground colour and markings.

C. rutilana, Hub.—Local. The imago appears in July and August among junipers, and is best looked for late in the afternoon, when the insect flies from twig to twig; but is not very easily taken. The larva feeds in a slight web on the shoots of the juniper, in April and May. It occurs at Croydon, Caterham, Box Hill, and Sanderstead.

C. bifasciana, Hub. = *Audouinana*, Dup.—Local and scarce. This insect is much out of position in our lists, as it is very closely allied to *A. Conwayana*, with which it is placed by Dr. Wocke. The imago appears towards the end of May and in June, and is to be taken on the wing at dusk. The localities are Haslemere; Darenth, Strood, Tonbridge; and Tilgate Forest.

Argyrolepia Hartmanniana, Clerk. = *Baumanniana*, Schiff.—Rather local. The imago appears in May and June among rushes in damp places. It has occurred at Haslemere; Darenth; Tilgate Forest and Hastings.

A. subbaumanniana, Wilk.—Local, and confined to the chalk. The imago appears in June and July, and has occurred at Croydon, Sanderstead, Mickleham, Box Hill; Darenth, Dover, Folkestone; Lewes, Brighton, &c.

A. zephyrana, Treit. = *Dubrisana*, Curt. — Local, but not uncommon. The imago appears in July and August, and is on the wing in the sunshine. The larva feeds in June in the roots of *Eryngium*, &c., and changes to a pupa the following month. The localities are Haslemere, Croydon, Box Hill; Tunbridge Wells, Margate, Dover, Folkestone; Lewes, and Brighton.

A. badiana, Schiff. — Rather local. The imago appears in July and August among *Arctium Lappa*, in the roots of which the larva feeds. It used to be common at Darenth, and also occurs at West Wickham; Dover, Folkestone, and Hastings.

A. cnicana, Doub.—Rather local. The imago occurs in May and June among thistles, but always in damp localities. It occurs at Haslemere and at Esher.

A. æneana, Hub. — Local and not common. The imago appears in June and July among ragwort, in the roots of which the larva feeds. The localities are Haslemere; near Strood, Folkestone.

A. Mussehliana, Treit.—This long-lost species has been taken at Deal by Messrs. Howard Vaughan and W. Purdey.

A. maritimana, Guen.—The species was first taken at Deal in 1854 by Mr. H. J. Harding, who found the larvæ feeding in the roots and stems of sea holly (*Eryngium maritimum*), from which he bred the perfect insect the following year.

Cochylis dipoltana, Hub.—Local. The larva feeds in a web among the seeds of yarrow in the autumn and winter; the imago appears in July and August, and has been taken at Croydon, Box Hill, Guildford; Charlton, Folkestone; and Worthing.

C. francillana, Fabr.—The imago is not uncommon around London amongst *Daucus carota*, and flies freely at dusk in July and August. It is also recorded from Sanderstead, Forest Hill, Croydon, Riddlesdown, Box Hill, Guildford; Darenth, Dover, Charlton, Folkestone; Lewes and Brighton.

C. dilucidana, Steph.—Widely distributed. The larva feeds in the stems of the wild parsnip (*Pastinaca sativa*); the imago appears in July.

C. Smeathmanniana, Fabr. — Local and uncommon. The imago appears in May and June, and flies freely at dusk. The larva feeds in the heads of *Achillea millefolium*, *Centaurea nigra*, &c. Its capture is recorded from Barnes, Croydon; Lewisham, Darenth, Dover.

C. straminea, Haw.—Widely distributed throughout, but not common. The imago appears in May and June among *Centaurea nigra*, in the heads of which the larva feeds.

C. alternana, Steph = *gigantana*, Guen. — This species appears restricted to the south-east corner of Kent, where, in some seasons, it is not uncommon. The imago appears in August and September among *Centaurea scabiosa*, in the heads of which the larva feeds.

C. inopiana, Haw.—Local. The imago occurs in June and July among fleabane (*Inula dysenterica*), and flies freely at dusk. It has occurred at Darenth, near Strood, Deal, Dover, Folkestone; and Hastings.

Aphelia osseana, Scop. = *pratana*, Hub.—The imago appears in July and August, and is very abundant on all downs and other similar localities on the chalk.

Tortricodes hyemana, Hub. — Abundant in all lanes and woody districts in the early spring. The female is more sluggish in her movements, and, when beaten out, usually drops.

Erratum.

Eupœcilia pallidana, Zell. = *albicapitana*, Cooke, was inserted by mistake in the above list, and must be struck out.

Addendum.

Peronea potentillana, Cooke.—Bred last year by Mr. William Purdey, of Folkestone, and by Mr. Howard Vaughan, to whom he sent pupæ, from larvæ found feeding in rolled-up leaves of wild strawberry at Folkestone.

Before closing the above list, I must express my thanks to Mr. C. G. Barrett and Mr. Howard Vaughan for much valuable assistance during the progress of this article, which has reached far greater length than I originally intended. Before commencing, I solicited (through advertisement in this magazine) local and private lists from entomologists working these counties. Of local lists, the only one of any assistance was that of Hastings and neighbourhood, kindly sent by the Rev. E. N. Bloomfield and Mr. E. A. Butler; while the private lists were still more disappointing. I was therefore obliged to depend largely on recorded localities, and those worked by myself and my own immediate friends. This must be my apology for certain localities being so frequently mentioned, while others equally favourable are almost entirely omitted.

Auburn Villa, Putney, S.W., November, 1880.

INTRODUCTORY PAPERS ON *ICHNEUMONIDÆ.*

By John B. Bridgman and Edward A. Fitch.

No. II.—ICHNEUMONIDÆ (*continued*).

A careful study of the foregoing tables will fully bear out our prefatory remarks as to the amount of variation existing in this somewhat extensive genus. Most of the species occur twice, owing to sexual variation; many are mentioned three times; *I. computatorius* and *I. varipes* occur four times; and *I. lineator* is so variable that it occurs seven times, and even in three sections (1, 3, and 8). This close affinity, constant variation, or the difficulty in rightly connecting the two sexes,—not always easy to determine, though the male is generally more slender,—often apparently distinct species, makes the genus *Ichneumon* especially puzzling to the beginner. Several teratological varieties of *Ichneumon* have been recorded and figured. Wesmael records three cases of gynandromorphism, none bilateral, but one fairly complete: that of *I. luctatorius* with its *extensorius* female (coloured plate, Bull. Ac. Brux., vol. iii., 1836); the other two cases are specimens of *I. comitator* and *I. nigritarius* which are partially gynandromorphous (Bull. Ac. Brux., xvi., pt. 2, p. 378). Tischbein describes and figures (Stett. Ent. Zeit., xxii., 428; pl. i., fig. 3) a polymelian *I. luctatorius* which has two well-developed tarsi, each with the normal five joints but one with only a single claw, on the right hind tibia, which is one-sixth shorter than the normal and left-hand one. In the National Collection there is a British specimen of *I. impressor* (*nigricornis*) with no areolet in the right fore wing: irregular neuration is not rare in the Hymenoptera, but had both wings of this *Ichneumon* been thus curiously abnormal it would probably have long remained a unique species (? genus). There is a constant variety of *I. latrator* female with abbreviated wings, which led Gravenhorst to establish a new genus (*Brachypterus*) for it, and Förster included it amongst the *Pezomachi* as *Pterocormus means;* this variety and the normal type are not uncommon in Britain, being frequently found, like many of the *Ichneumonidæ*, under moss or loose bark from autumn to spring. This interesting variety, unique in this family, has been figured by Stephens, Wesmael, and Vollenhoven (twice). Until quite lately there have been but few figures of *Ichneumon.*

Albin, Donovan, and some of the earlier English authors figured species which, although fairly good, are hardly capable of identification with certainty; so also with the figures of Réaumur and DeGeer. Coquebert figured *I. Coqueberti* (*fusorius*); there are good coloured figures of *I. primatorius* (*grossorius*) and *I. flavatorius* in Panzer; this latter species is also figured by Ratzeburg, as well as *I. dumeticola* (*piniperdæ*), *I. pisorius*, and *I. nigritarius*; *I. dimidiatus* is beautifully figured (coloured) by Westwood in Stephens' 'Ill.-Mandib.' We now have excellent figures of twelve British species belonging to this genus in Vollenhoven's 'Pinacographia.' The identification of an *Ichneumon* would thus appear as difficult as it may be interesting, but our table will at least serve to determine a specimen as one of two or three species, and then the respective descriptions of Gravenhorst, Wesmael, Holmgren, or other authority should be consulted. It must, however, be remembered that colour and size are the most liable to variation; sculpture is generally constant. Marshall's Catalogue includes 144 species, and in the 'Entomologist's Annual' for 1874, *I. vulneratorius*, Zett., is added, where see the synonymy as copied from Holmgren; but Wesmael's *I. hæmatonotus* is a distinct species (Ent. Tid. i. 78). This is included in the table, and all Marshall's species, except his numbers 60, 61, 114, 119, and 136. Of these *I. variegatorius* (60) and *I. leucostigmus* (61) were included by Wesmael in a new genus *Hepiopelmus*; this is followed by Tischbein, and reluctantly by Vollenhoven; but since it appears desirable, such will be done here. *I. cerinthius* (114) is an *Amblyteles*, and will appear in that genus. *I. deceptor* (119) is retained on the strength of Gravenhorst's var. 5 alone, who says, "Marem unicum, circa Netley captum Hope mihi misit"; it was not in Marshall's 1870 Catalogue, and is, we think rightly, omitted here. The male of *I. perileucus*, Gr., is *Amblyteles funereus* (in 'Ent. Soc. Cat.,' p. 24, l. 8, for male read female), and the female *I. perileucus* (var. 1), Gr., is *A. fossorius*; Marshall gives *I. perileucus* (36) in the genus *Ichneumon*, with a reference to Stephens, but he describes both male and female; therefore, to save more confusion, the species is not included here. There are several species already casting their shadows on the British fauna, but they cannot now be referred to.

A study of a series of bred specimens in many species of

Ichneumon would probably lead to a very material alteration of the specific or diagnostic characters. It has been already stated that the *Ichneumonidæ* are exclusively parasitic on Lepidoptera, and if these had not been so generally despised by lepidopterists, as at present, it is probable that we should have a much better knowledge of their systematic arrangement. There are few good collections of British *Ichneumonidæ;* that in the British Museum is very rich in specimens, but from its almost chaotic arrangement this vast *materiel* is nearly valueless: it contains the rich collections of J. F. Stephens (which included those of Francillon, Marsham, Haworth, Donovan, &c.) and T. Desvignes; three hundred and twenty-five ichneumons (many still unique) from Heysham's collection were purchased at Stevens's; besides many specimens since added by Walker, Smith, Marshall, and others. Ruthe's general collection of *Ichneumonidæ* is also in the Museum, and two hundred and forty-seven Gravenhorstian types, sixty-one of which belong to this family. The Hopeian Collection at Oxford contains of European ichneumons:—(1) an old collection, probably named by Fabricius; (2) several drawers filled with Gravenhorst's types; (3) many species named by Stephens; (4) a small collection received from Förster; (5) the Saundersian collection, arranged by F. Smith; (6) Westwood's British collection; (7) a small collection received from Wesmael; (8) the greater part of F. Walker's British collection; (9) several drawers of undetermined British specimens, mostly collected by Rev. F. W. Hope. The Linnean collection is at Burlington House.

The species of *Ichneumon* are all solitary in their parasitism, never more than one living in the same host; when more is known of their biology it will probably be found that many species are conditionally monophagous, that is, they are always attached to the same or a closely allied lepidopteron, but to this possible rule we already know of several conspicuous exceptions amongst the commoner species. It appears that the mother *Ichneumon* mostly attacks its victim larva when nearly or quite full-fed, but the manner or time of oviposition has seldom been observed; as many Lepidoptera, especially *Noctuæ,* hybernate as larvæ, it is probable that oviposition takes place in the spring. The species of *Ichneumon* mostly emerge in the late summer or autumn, and very many of these are known to hybernate as imagos, especially the females; however, in Ratzeburg's interesting 'Krankengeschichten' (Nos. 4 & 5) several species are mentioned as appearing from April to June; these were from *Trachea piniperda*, from which Ratzeburg bred twenty-six to twenty-eight different ichneumons. Another possible rule is that the time of appearance of the parasite is about the same as that of its host. We know that a larva exhibits little or no sign of being affected when a species of this family is the preyer; it is not so in many other cases of ichneumon parasitism. If a full-fed larva or pupa be more sluggish or of a darker colour than usual, or if it does not emerge at the proper season, it probably contains a parasite. In no known instance does the host of *Ichneumon* die till it becomes a pupa; hence the emergence of a parasite belonging to this genus, or even family, instead of the lepidopterous imago, is frequently quite unexpected. The *Ichneumon* pupa invariably, we believe, lies with its head in the same direction as that of its host, whose pupa-skin is filled with a thick fluid which varies in consistency and colour—yellowish or greenish; this surrounds the naked *Ichneumon* pupa, and in some species the whole abdomen of the pupa is filled with the fluid. After emergence the affected pupa may easily be recognised. In the usual metamorphosis of the lepidopteron the pupa is ruptured on the thorax, and the wing-cases invariably broken along the antennæ; where an *Ichneumon* has emerged these are entire, the pupa-case being opened with a clean transverse cut just below the eyes; sometimes the anterior part is cut quite off, but more often a portion of the pupa-case is unsevered, whether dorsal or ventral seems immaterial. A detailed description of the larva and pupa of *I. pisorius* is given by Ratzeburg ('Die Ichneumonen,' i., 131), who tells us he was well acquainted with those of many species.

Every available authority has been consulted for the compilation of the following list of *Ichneumon* hosts, but its accuracy cannot be fully relied upon, from the difficulties of identification and errors of synonymy. The species are numbered as in Marshall's Catalogue; the author of the biological information is quoted in each instance, the name being given in Roman letters after the name of the ichneumonized insect; those Lepidoptera not now known as British are marked with an asterisk.

1. pisorius, *L.*	from	Smerinthus ocellatus; Bouché. S. populi; Bouché. Sphinx ligustri; Ratzeburg. S. pinastri; Hartig, Ratz., Brischke. Ptilodontis palpina; Giraud. Tryphæna pronuba; Gir. Hadena pisi; Linné, ? Ratz.
2. bilineatus, *Gmel.*	„	Abraxas grossulariata; Vollenhoven. Bryophila glandifera; Bignell.
3. similatorius, *Fabr.*	„	Melanippe luctuata*; Brischke (very near *M. tristata*).
4. Coqueberti, *Wesm.*	„	Callimorpha dominula; Boie.
5. Bohemani, *Holmgr.*	„	Noctua; Brischke.
6. sugillatorius, *L.*	„	Liparis monacha; Ratz.
9. leucocerus, *Gr.*	„	Acronycta megacephala; Gir.
10. lineator, *Fabr.*	„	Bombyx; Stephens, Brischke. Ypsipetes elutata; Boie. Eurranthis plumistraria*; Gir. Bryophila glandifera; Rondani. Nonagria geminipuncta; Weston. Noctua; Porritt. Tortrix cratægana; Goureau.
14. rufinus, *Gr.*	„	Hemithea thymiaria; Brischke. Ophiodes illunaris*; Kirchner.
15. impressor, *Zett.*	„	Gortyna flavago; Bridgman.
16. ruficaudus, *Wesm.*	„	Cosmia trapezina; Brischke.
17. comitator, *L.*	„	Bombyx; Steph. Cleora viduaria; Speyer (Ratz.) Fidonia piniaria; Muss (Hart.). Abraxas grossulariata; Steph. Plusia gamma; Rond.
20. fuscipes, *Gmel*	„	Noctua; Brischke.
21. periscelis, *Wesm.*	„	Noctua; Brischke.
22. pistorius, *Gr.*	„	Orgyia pudibunda; Voll.
23. culpator, *Schr.*	„	Melitæa Athalia; Rond. Setina aurita*; Fallou (Gir.). Trichiura cratægi; Rond.
25. trilineatus, *Gmel.*	„	Abraxas grossulariata; Ratz., Holmgr., Brischke, Barrett, Bignell.
Var. umbraculosus, *Gr.*	„	Arctia caja; Steph. Abraxas grossulariata; Steph. Trachea piniperda; Brischke.
26. scutellator, *Gr.*	„	? Liparis chrysorrhœa; Réaumur. Abraxas grossulariata; Kawall. Trachea piniperda; Ratz.
27. multiannulatus, *Gr.*	„	Dicranura vinula; Marshall.
28. molitorius, *L.*	„	Noctua brunnea; Boie. Trachea piniperda; Brischke.
29. punctus, *Gr.*	„	Caradrina sp.; Gir.
30. computatorius, *Müll.*	„	Orgyia pudibunda; Tischbein.
32. vaginatorius, *L.*	„	Diloba cæruleocephala; Graff (Ratz.). Noctua; Brischke.
33. xanthorius, *Forst.*	„	Polyphænis sericata*; Mocsary.
34. confusorius, *Gr.*	„	Dicranura bicuspis; Marshall. Nonagria nexa*; Brischke. N. sparganii; Voll. Gortyna flavago; Boie, Drewsen, Brischke. Tryphæna pronuba; Steph. Noctua bella; Voll. Noctua; Steph., Brischke. Cucullia Santonici*; Wullschleger.

37. gracilentus, *Wesm.*	from	Nonagria sparganii; Voll.
42. luctatorius, *L.*	„	Vanessa Polychloros; Nees (teste Gr.). V. urticæ; Gir. Satyrus Janira; Schmidt (Ratz.). Polyommatus Circe*; Rond. Lycæna Cyllarus*; Goureau.
53. formosus, *Gr.*	„	Chelonia plantaginis; Brischke. Arctia fuliginosa; Gravenhorst.
57. raptorius, *L.*	„	Satyrus Janira; Brischke. Liparis monacha; Ratz. Liparis; Rond.
62. quæsitorius, *L.*	„	Nonagria typhæ; Desvignes, Fitch. N. geminipuncta; Desvignes, Marshall.
63. cessator, *Mull.*	„	Vanessa Polychloros; Brischke. Acronycta sp.; Gir.
67. saturatorius, *L.*	„	Dicranura vinula; DeGeer. Meliana flammea; Boie. Calamia phragmitidis; Boie. Plusia sp.; Gir.
69. nigritarius, *Gr.*	„	Eriogaster lanestris; Harrach. Angerona prunaria; Harrach. Macaria liturata; Ratz. M. signaria*; Rond. Fidonia piniaria; Ratz., Brischke. Clostera reclusa; Voll. Trachea piniperda; Boie, Ratz., Brischke. Tæniocampa miniosa; Desvignes (B. M. Coll.). Plusia gamma; Steph. P. festucæ; Steph. Noctua; Steph., Ratz., Dours.
71. fabricator, *Fabr.*	„	Orgyia pudibunda; Ratz. Macaria lituraria; Ratz. Notodonta dromedarius; Marshall. Axylia putris; Bridgman. Trachea piniperda; Hart., Ratz.
73. pallidifrons, *Gr.*	„	Trachea piniperda; Brischke.
74. maculifrons, *Steph.*	„	Amphydasis prodromaria; Steph.
75. coruscator, *L.*	„	Agriopis aprilina; Grav.
78. jugatus, *Gr.*	„	Fidonia piniaria; Brischke.
80. pallidatorius, *Gr.*	„	Lithosia rubricollis; Gir. Cidaria corylata; Brischke.
83. vacillatorius, *Gr.*	„	Depressaria heracliella; Bignell.
84. monostagon, *Gr.*	„	Nonagria geminipuncta; Voll. N. sparganii; Voll.
85. dumeticola, *Gr.*	„	Lithosia quadra; Gir. Trachea piniperda; Ratz.
87. oscillator, *Wesm.*	„	Trichiura cratægi; Rond.
89. chionomus, *Wesm.*	„	Geometra; Brischke.
91. flavatorius, *Fabr.*	„	Smerinthus tiliæ; Steph., Rond. Liparis salicis; Boie. L. dispar; Steph., Gir., Voll. L. monacha; Ratz., Kawall.
94. callicerus, *Gr.*	„	Hadena adusta: Brischke.
96. derogator, *Wesm.*	„	Macaria liturata; Ratz. Trachea piniperda; Boie, Ratz.
97. bilunulatus, *Gr.*	„	Orgyia pudibunda; Rond. Trachea piniperda; Ratz., Voll., Brischke. Hadena adusta; Brischke.
Var. derivator, *Wesm.*	„	Fidonia piniaria; Brischke.

99. ochropus, *Gmel.*	from Abraxas grossulariata; Steph., Brischke.
102. exornatus, *Wesm.*	,, Macaria liturata; Graff (Ratz.). Cidaria fulvata; Hart., Ratz.
106. albicinctus, *Gr.*	,, Fidonia piniaria; Bernuth, Ratz., Brischke.
126. gasterator, *Steph.*	,, Depressaria heracliella; Marshall.

HOPLISMENUS, *Gr.*

Antennæ white-ringed (*perniciosus* male, generally with no ring). Scutellum pale.

A. Abdomen red, or red and black (1st—3rd segments testaceous in *aulicus*).

a. Hinder tarsi black, 2nd—4th joints pale.
All the femora and front tibiæ red (hinder legs sometimes more or less black). - 1. *perniciosus*, 4—5 lines, male and female (*h*, *s*, *l*, *a*).

b. Hinder tarsi yellowish, also tibiæ and front tarsi.
3. *aulicus*, 4½—5 lines, male.

B. Abdomen tricoloured; femora and tibiæ red; apex of hinder black; hind tarsi white-ringed (legs sometimes more or less black or brown).
2. *uniguttatus*, 4 lines, male and female (*a*, *l*).

The species of *Hoplismenus* appear to be uncommon in Britain. Some thirteen species are known on the Continent, most of which ought to occur here. *Ichneumon exornatus*, Wesm. (= *pictus*, Gr.), *Platylabus dimidiatus*, Gr., *P. errabundus*, Gr. (= *albinus*, Gr.), were all included in *Hoplismenus* by Desvignes; his *H. semirufus*, described in the B. M. catalogue, is also a *Platylabus*. Five species of this genus are known to be parasitic upon butterflies. *H. perniciosus*, our commonest species, was bred by Giraud from a *Satyrus Mæra** pupa, and Brischke bred *H. bidentatus*, Gr. (var. of *perniciosus*, teste Marshall), from *Aspilates strigillaria*. Kriechbaumer says *H. aulicus* is probably attached to a willow- or sallow-feeding larva. He also met with the female, which Tischbein has described; making a new genus (*Hybophorus*) for this species amongst the *Ichneumones amblypygi* near *Trogus* (Stett. Ent. Zeit. xxxvi. 280).

EXOPHANES, *Wesm.*

Scutellum yellow or whitish. Females, abdomen, 2nd, 3rd, and sometimes part of 4th segments red, anus white; males, 2nd—4th red (a); 2nd, 3rd, and sometimes a spot on 7th, yellow (b.)

a. Hind femora black. . - - - 1. *exulans*, 4½—5 lines.

b. Hind femora reddish or fulvous. - - 2. *occupator*, 5—6 lines.

Our two species of *Exophanes* are fairly common, and they are very liable to be mistaken for similarly-coloured species of

Ichneumon; E. occupator, male, especially resembles the *luctatorius* group. In *Exophanes* the gastrocæli are hardly distinguishable: this is a good distinctive characteristic. Both our species, in which the sexes differ greatly, are well figured by Vollenhoven ('Pinacographia,' pl. 2, figs. 3 & 4). The common *E. exulans*, which is better known by its female name (*hilaris*), Vollenhoven tells us, was bred in June from *Tapinostola Elymi*. Holmgren first bred *E. occupator* from *Nonagria typhæ*, and Swierstra bred it from *Nonagria sparganii* (teste Vollenhoven); while Vollenhoven also bred it from *N. typhæ*. In the third week of August, 1879, Mr. W. R. Jeffrey bred this species from British *N. sparganii* pupæ.

(To be continued.)

NOTE ON THE GENUS *ORTHEZIA*.

By F. Buchanan White, M.D., F.L.S.

As Mr. H. C. Hart in recording, in the last number of the 'Entomologist' (Entom. xiii. 284), the occurrence in Ireland of *Dorthesia chiton* alludes to me, I am tempted to make a few remarks on this interesting insect.

In the first place there is a difference of opinion as to which is the correct generic name, *Orthezia* or *Dorthesia*. The name was created in honour of the Abbé d'Orthez, and was written "*Orthezia*" by Bosc, who, in the 'Journal de Physique' for 1874 (p. 171), published a memoir, entitled "Description de l'*Orthezia characias*." In the same journal for the following year, 1875 (p. 207), the Abbé d'Orthez himself changes the orthography of the name to "*Dorthesia*," and many authors have adopted his name. Bosc, the author of the genus, entitled it *Orthezia*, and no other can be used, as *Orthezia* and *Dorthesia*, considered as scientific names, are quite different words. In adopting *Orthezia* I only follow Amyot, Serville, and Signoret.

In the second place as to the species. Of these (excluding one or two extra-European ones) no less than ten or eleven have been described, but almost all of them seem to be identical with *Urticæ*, L. (*Aphis urticæ*, L., Syst. Nat. ii. 733, 30); or at least that is the conclusion that Signoret, in his recent classic 'Essai sur les Cochenilles,' arrives at. He says that he has met with specimens in several countries, and received them from others, and that they are all referable to *Urticæ*, L., and suggests that the various so-called species that have been described have been founded on different states of *Urticæ*. The names Signoret cites as synonymous with *Urticæ*, L., are:—*Characias*, Bosc; *Delavauxi*, Thibaut; *Floccosa*, De Geer; *Cataphracta*, Shaw; *Chiton*, Zett.; ? *Uva*, Modeer; *Glechomæ*, Fab. sec. Burmeister; *Dubius*, Panzer; *Dispar*, Kaltenb. Signoret is probably right in sinking most of these so-called species, but it seems to me possible that one or two of them may be really distinct from *Urticæ*, though probably not recognisable by the published descriptions. Amongst these may be Zetterstedt's *Chiton* (of which I have not seen a description), but there is many a conjecture induced by the northern habitat. I should much like to know on what grounds Mr. Hart has identified his Greenland specimens with Zetterstedt's species.

As to my *Signoreti* it is thoroughly distinct from *Urticæ*, L. The shape of the antennæ and the different proportions of the front legs serve to separate it at once. It is far from rare in Scotland, where *Urticæ* also occurs; but the latter I have found only in the south-west and near Glasgow. It is quite possible that *Signoreti* may be identical with *Chiton*, Zett., in which case we will have to adopt the latter name. In Ireland I should expect both *Urticæ* and *Signoreti* to occur; and if Mr. Hart will continue his search he will no doubt meet with both. From England I have seen *Urticæ* only. It occurs in the neighbourhood of London, and probably in many other places. *Signoreti* may very probably occur in the more mountainous districts. I shall be happy to name any specimens that may be entrusted to me.

A brief description may be useful to those who are not acquainted with these interesting insects. In form they (or at least the females and larvæ) are flattish and oval, and often under the twelfth of an inch in length. In colour usually of a dead white (but sometimes slightly discoloured) from the numerous flakes and layers of a calcareous-like secretion (probably waxy in its nature) with which they are covered; the legs and antennæ generally brown or pinkish brown. The males only are winged, and are in appearance and colour (a clear brown) very different from their humble partners, which are far more commonly met with. The calcareous-like secretion with which the females are covered forms a kind of bag at the end of the abdomen, in which the eggs are deposited and hatched. The young larvæ are like their mother, but differ in the number of the joints of their antennæ, &c.; and the form of the male and female larvæ is somewhat different. Like other hemipterous insects, the mouth is formed for sucking.

Orthezia Signoreti usually lives amongst mosses, or under decaying leaves of ferns and other plants; and, like Mr. Hart, I first met with it when looking for land shells. It is very sluggish in habit, scarcely moving at all when found, but tucking its legs and antennæ underneath it looks somewhat like a small flat seed, or like the cocoon of some other insect.

O. Urticæ, on the other hand, lives more exposed, and occurs upon various plants, such as the greater stitchwort (*Stellaria holostea*), nettle, geranium, *Euphorbia characias* (whence the name *Orthezia characias*), &c.

D'Orthez, who carefully studied the habits of this insect, says that the larva of a beetle attacks and devours the eggs in the maternal pouch, but without attacking the mother.

Though placed amongst the cochineal, or scale-insects, *Orthezia* has many peculiarities, and is well worth studying.

Perth, November 13, 1880.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Description of the Larva of Acidalia ochrata. — This extremely local species has not hitherto been recorded as bred in England. The following notes will be of interest:—The eggs are not apparently attached to the food, but dropped loosely amongst it. They hatch in a few days, about the first week in August. Having no information of food-plant, a general selection of the most probable was made, and placed in a wide-mouth bottle for their choice. For the first week, so little sign was there of any feeding that I feared I had lost them. After two or three weeks, although they made very little progress, still they were alive, and must have eaten something. Generally, most of the little larvæ were on or near *Galium verum* flowers, one of the plants supplied. Still being so small the frass was hardly perceptible; as time went on it became more apparent that they ate only, or at any rate principally, the withered flowers of the *Galium*. During the month of August, as long as this plant could be obtained in bloom, it was continued as food; when this could no longer be obtained I had to seek some other food, and early in September I tried flowers of golden-rod. The larvæ took to this readily enough, although evidently not a natural food, as the golden-rod did not grow in the district where the moths were taken. I simply tried it because I had it growing in my garden. My stock of this plant failing, Mr. W. H. Grigg, of Bristol, kindly sent me a weekly supply of it by post, until the middle of October, when flowers could no longer be obtained. By this time about ten of the larvæ had fed up much in advance of the rest of the brood, and almost gave me hope that, provided I could get them food, they might be induced to feed up this year. I pondered as to what food I could procure, when *Crepis virens* suggested itself to me, from the fact of recollecting that a species of *Crepis* was very plentiful in their habitat. *Crepis virens* being a late-flowering plant and common on Blackheath, there was not much difficulty in getting flowers of it to try, and it proved a complete success. Some of these flowers were placed in a glass cylinder, with a few broken pieces of flower-pot, light soil, and moss, which were kept moist, but not wet, having a free drainage. This cylinder was kept in a warm room, and the ten forward larvæ now fed up rapidly; and by the 1st November the first one had spun up. I immediately despatched one of the largest to Mr. Buckler, who has secured three drawings of this long-desired species. I may mention that at first I had tried the coast *Crepis*, but then only the leaves. They did not apparently care for them at all, or in fact for foliage of any kind. Flowers, when withered, appeared to be most to their taste. The full-fed larva may be briefly described, being almost without ornamentation and of an almost uniform warm stone-colour; it is about three-quarters of an inch long, moderately stout for an *Acidalia*, slightly thickest in the middle, and tapering gradually to the head, which is rather flat and small. The dorsal and subdorsal lines are obscurely indicated. When viewed through a glass of low power the dorsal line is seen to be composed of two fine parallel lines of faint grey; the subdorsal lines by a broken and indistinct row of grey dots, most distinct on the 10th, 11th, and 12th segments. The whole dorsal area is seen to be a series of fine transverse wrinkles, which, with a higher power, appear very like the ridges of corduroy, such as used for workmen's trousers. The spiracular line is closely marked by a produced and wrinkled skin-fold, which towards the head appears almost fringed, and to which portions of the yellow petals, or rather florets, often adhere. The abdomen and claspers are of the same uniform stone-colour, with a faint indication of a double row of dark spots, two or four on each segment. The larva spins a few coarse threads of silk, drawing together portions of food-plant or moss into an open-work cocoon, through which can readily be seen the light brown chrysalis. Naturally these larvæ would hybernate, which the rest of my brood are now doing.—W. H. Tugwell; 3, Lewisham Road, Greenwich, November 13, 1880.

Treatment of Hybernating Larvæ.—Last year I referred to the ice-house treatment of hybernating larvæ (Entom. xii. 290), and knowing how difficult it is to carry many species that hybernate as young larvæ through the winter, especially amongst the Diurni and Bombyces, the following remarks of Mr. W. H. Edwards may possibly be instructive. They appeared in the 'Canadian Entomologist' for August, 1880 (vol. xii., p. 143):—"In 'Can. Ent.,' vi., p. 121 (1874), I gave a general account of breeding the larvæ of *Argynnis Cybele*, *A. Aphrodite*, and *A. Diana*. Since that date I have bred *A. Cybele* as well as other species of this group, but before 1880 I always lost the larger part of the larvæ during the winter, or they died off at their successive stages, or in chrysalis. I attempted to keep the larvæ after hatching, which occurs in September or October, in a cool room free from dampness, they being placed on stems of violets growing in pots. But the alternation of warm with cold weather during the fall and winter was unsuitable for the larvæ, the leaves dropped off, or the plants died, and there was a constant loss. After the survivors were brought into a warm room later in the winter they were not healthy, but lingered along, every stage being protracted, many perishing, even up to chrysalis and imago, or the butterflies perhaps came out crippled. In 1873, starting with more than three hundred young larvæ of *A. Diana*, I obtained but a single butterfly. From as many eggs of *A. Cybele* I got three butterflies, and of *A. Aphrodite* one chrysalis only, which died before imago. Encouraged by the results obtained by freezing the larvæ of *Satyrus Alope* in winter of 1878-79, I determined to try the effect of cold on the larvæ of *A. Cybele*, and availing myself of the kindly offered aid of Prof. C. H. Fernald, I sent a considerable number of recently-hatched larvæ to him at Orono, Maine, to be placed in ice-house. They were in small paper pill-boxes, the unglazed sides of which afforded foothold. I had found that the eggs or larvæ of *S. Alope* escaped mould in such boxes, while others on cloth were destroyed. These little boxes were placed in a flat tin box, which was deposited in the sawdust beneath the ice, 'frozen sawdust,' as Prof. Fernald wrote. Five months later, on 5th March, 1880, I received the boxes by mail. The larvæ were found to be nearly all alive—not more than one or two dead—and when first seen several showed some movement, though only three days from ice. Others were lethargic some hours longer, but by the 6th nearly all had left the boxes and betaken themselves to the plants of violet amid which I had laid them. They crawled up and down the stems, and disposed themselves in the concave sides just as they do in the fall when about to go into lethargy. On 10th March one of the larvæ was found to have passed first moult, several days in advance of any other, and it continued in advance to maturity, passing second moult, 18th; third, 27th; fourth, 4th April; fifth, 12th April; suspended, 23rd; pupated, 24th; and gave imago, *A. Cybele*, female, 14th May. The whole period from ice to butterfly was seventy-three days. The other larvæ passed first moult 19th March; second, 29th March to 2nd April; third, 4th to 6th April; fourth, 11th to 12th; fifth, 16th to 19th April; and the butterflies issued 12th to 27th May. What loss of larvæ there was occurred before first moult, partly by escape, as it seemed, but partly, as I thought, from having been introduced to a warm room too abruptly. But after the moult I lost none. I preserved some examples at every stage in alcohol, and so reduced the number; but there was no death among the larvæ which were allowed to proceed, and I obtained at last seven perfect butterflies, one male, six females. They were also of very large size, equal to any taken in the field. It is evident, therefore, that freezing did not injure the larvæ, but on the contrary, invigorated them, enabling them to pass their successive stages rapidly. [A comparative table is then given of the duration of the various stages in the specimens iced in 1880 and those kept in the cool room in 1873-4. The iced larvæ from removal to imago occupied a total period of from 54 to 87 days, the others 134 days and upwards. The first moult was reached by the frozen larvæ in from 8 to 18 days, while the earliest of the other batch did not change till the 44th day.] I have no doubt that by freezing any species of larvæ which hybernate, they may successfully be carried to imago—such as *Argynnis*, *Melitæa*, *Colias*, *Apatura*, Satyrids, Hesperians, &c. Probably it would be better not to remove them from the ice until spring has fairly set in, instead of rousing them prematurely, as I did in the case of *A. Cybele*. Comparing the coloration of the butterflies from the iced larvæ with examples taken this season in the field, I see no difference."—EDWARD A. FITCH.

VANESSA ANTIOPA NEAR CLAVERTON.—I have just had the pleasure of adding to my collection a specimen of *Vanessa Antiopa*, captured on a greengage-tree in the rectory-garden of the adjoining parish of Claverton. The capture was made on the 3rd September, 1880, by the son of the rector, and, owing to his inexperienced handling, the specimen is not so perfect as I could wish.—J. G. ROSS; Bathampton Lodge, Bathampton, near Bath, October 26, 1880.

CHŒROCAMPA CELERIO NEAR BIRMINGHAM.—I am pleased to be able to hand you another instance of the capture of *C. celerio*, besides those already recorded in the 'Entomologist'; it was caught at Edgbaston, near Birmingham, last week. It is a finely marked specimen, though, unfortunately, its upper wings were both torn in capturing it. It passed into the hands of Mr. F. Coburn, taxidermist, of this town.—GEORGE T. BAKER; The Bracken, Augustus Road, November 8, 1880.

ODONESTIS POTATORIA VAR.—I have a variety of *Odonestis potatoria*, the converse of that mentioned by Mr. Jenner Weir at page 207 of this volume. Mine is a male, with the light colour of the female.—R. W. BOWYER; Haileybury, Hertford.

CATOCALA FRAXINI NEAR RUGBY.—It may interest some of your readers to hear of the capture here of a fine specimen of *Catocala fraxini*. I took it on the night of 31st August, when sugaring. I do not hear of one being previously taken in this neighbourhood.—T. W. WRATISLAW; Rugby, Sept. 25, 1880.

LITHOSIA QUADRA IN DORSETSHIRE.—A specimen of *Lithosia quadra* was taken in July by C. F. Benthall at Sherborne, in Dorsetshire; I forget the exact date. He observed a strange-looking wasp flying near his garden, and, on capturing it, found that it was carrying a half-eaten specimen of this moth in its mouth, two of the wings having been torn off. This is the first time *L. quadra* has been seen near Sherborne.—CHAS. E. INCE; 29, St. Stephen's Avenue, Shepherd's Bush, W., Nov. 8, 1880.

EPIONE VESPERTARIA AT ARUNDEL.—On August 29th of last year (1879) I captured a specimen of this insect at Arundel. I see that in the 'Insect Hunter's Companion,' by the Rev. J. Greene, Brandeston, in Suffolk, is given as a locality. The only localities mentioned by Mr. Stainton are York and Lyndhurst. Both Mr. Fitch and Mr. J. Weir identify it as *Epione vespertaria.* The specimen I captured is an exceedingly small one, not more than half the usual size.—A. SIDNEY OLLIFF; 36, Mornington Road, Regent's Park, W., November 5, 1880.

ABRAXAS GROSSULARIATA DOUBLE-BROODED.—During last May and June I collected about 4000 larvæ of this species, and bred about 3000 perfect specimens from the May-gathered larvæ, whilst nearly all the latter ones were Ichneumoned, or, though they made up, failed to produce imagines. On visiting last week one of the localities where I got about 2000 larvæ early in May, I found two pupæ just made up, and larvæ full-fed. These I brought home, and some have gone into chrysalis, whilst others are about to do so. I am curious to know what the imagos from them will be like, not having ever known this species to be double-brooded before. I note it, and shall be glad to hear if any of our fellow-workers have observed a similar instance.—C. S. GREGSON; Stanley, Liverpool, October 20, 1880.

[At p. 20, vol. xii., of this magazine, Mr. Silcock relates a similar instance in November, 1879; but we have not heard that the pupæ produced abnormal forms. Perhaps Mr. Silcock will communicate the result of those pupæ.—ED.]

PŒDISCA SORDIDANA.—On the 26th of September Mr. G. Jackson and myself went to Bishop's Wood, Cawood, to look for larvæ of *Eupithecia trisignata* and *E. albipunctata,* and, having worked very hard for three hours with no success, we turned our attention to beating alder, larch, nut, &c. We soon began to find a Tortrix rather commonly, which I at first took for worn *P. solandriana,* but thought them very late. However, upon a more close examination, I found it was not that species, but the true *P. sordidana* = *Stabilana* of Stainton's Manual. I feel quite sure that an error is often made by persons mistaking this species for *P. semifuscana,* but any one who has bred the latter species will at once see that the posterior wings are much lighter and more glossy than in *P. sordidana.* I went again on the 30th, and got a long series, but I was about ten days too late for really fine specimens. I have not the least doubt the larva feeds on alder, for, although we beat other trees in the vicinity as long as we could, we only got them from the alder trees. *P. semifuscana* feeds abundantly on the *Myrica Gale* in Askham Bog, and is very variable. The moth appears in July and August. *P. sordidana* is very constant in markings, and varies very little in colour; some are a little more fuscous than others, and the under wings are dark grey. I also beat about thirty specimens of *Pædisca opthalmicana* from poplar in the same wood at the same time.—W. Prest; 18, Holgate Road, York.

Homolobus discolor, *Wesm.*, **bred.**—At p. 89 of this volume Dr. Capron recorded the capture of five females of *Homolobus discolor*, beaten from hazel. I had the pleasure of breeding a female in September, 1879, and to-day I have bred two, both females, from *Cabera pusaria* larvæ beaten from alder. This will, I think, throw some light on their having been beaten from hazel, the food also of *C. pusaria*. I was not quite positive from what larva the one I bred last year emerged; hence the reason I did not record it.—G. C. Bignell; Stonehouse, Plymouth.

The Miers Collection.—The very large and extensive entomological collection made by the late John Miers, F.R.S., has been presented to the Ashmolean Museum at Oxford, and is now being studied and incorporated by Prof. Westwood. This collection is particularly rich in Brazilian insects, and thus becomes peculiarly valuable for the Oxford collection, which was, compared with other regions, poor in the neotropical fauna.—'Nature,' November 11, 1880.

Erratum.—At page 278, vol. xiii., for *Apatura Iris*, var. *Ilia*, read var. *Iole*.

OBITUARY.

Francis Owen, M.R.C.S.—We regret to record the death of Mr. Francis Owen, of Sunnyside, Leatherhead, surgeon; well known by many of our readers as a lepidopterist. Mr. Owen unfortunately lost his life while on his professional work on the night of October 21st, by accidentally walking into the canal near Kintbury, Surrey, when he was drowned.—J. T. C.

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> "By mutual confidence and mutual aid
> Great deeds are done and great discoveries made."
> Pope's '*Homer.*'

VOLUME THE FOURTEENTH.

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> "I said that 'all the years invent;
> Each month is various to present
> The world with some development.'"
>
> TENNYSON'S '*Two Voices.*'

> "Not only does the marvellous structure of each organised being involve the whole past history of the earth, but such apparently unimportant facts as the presence of certain types of plants or animals in one island rather than in another, are now shown to be dependent on the long series of past geological changes—on those marvellous astronomical revolutions which cause a periodic variation of terrestrial climates, and on the endlessly varied actions and reactions of organised beings on each other. . . . We are thus encouraged to study more completely every detail and every anomaly in the distribution of living things, in firm conviction that by so doing we shall obtain a fuller and clearer insight into the course of nature."
>
> ALFRED RUSSEL WALLACE, *in 'Island Life.'*

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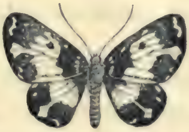
VARIETY OF MELANIPPE HASTATA.



Melanippe hastata, *var.*

The above very pretty variety of *Melanippe hastata* was taken in June, 1880, by Mr. William Prest, of York, while he was collecting in Edlington Wood, near Doncaster. At the same time Mr. Prest captured a long series of the normal type of this insect, but no other variety.

John T. Carrington.

NOTES ON THE LEPIDOPTERA OF NATAL.

By William D. Gooch, C.E.

(Continued from vol. xiii., p. 276.)

The larvæ of the *Acræidæ* in Natal seem to have a tendency to gregarious habits, especially *Cynthia* and *Petræa*. *Violarum* also generally occurs numerously on any food-plant which is frequented by it. The young of *Cynthia* are common on a woolly-leaved *Lamium*, of which they eat away the under side of the leaf, curling it over, and enveloping it with silk threads, in which the exuviæ and cast-skins get entangled. I have counted over eighty specimens in one brood.

The larvæ of *Petræa* do not, so far as I have observed, spin a common web, but they are very abundant. One shrub of the food-plant was year after year attacked by them in hundreds; and in the pupa state, I picked one branch with over twenty of the rather brilliantly marked pupæ attached to it. They seemed to have a peculiar liking for this one shrub, the only one out of several of the same size and species in the same spot and aspect, and apparently similar condition, which the larvæ ever attacked. Every entomologist must have had an experience of this character, and possibly has found as little explanation for it as I have.

Lycia is found on a sort of "flowering grass," which is a ground creeper in damp places; it is not very gregarious, but occurs sparsely over the masses of the food-plant on the ground. *Natalica* and *Petræa* feed on a succulent creeper, which is a favourite also with *Zetes* and *Hypatia*. The larvæ generally are prettily but not conspicuously coloured, and the pupæ marked with black or red lozenges and angles. Some of the male imagines of the *Acræidæ* are furnished with horny appendages below the abdomen, of which I could never ascertain the use. I have not heard whether this has been noticed generally.

NYMPHALIDÆ.

Nymphalidæ both in number and display is very well represented in its many branches, and a South African collection gives a very fair facies of this important and popular family. The drawers of my cabinet containing them were those gazed upon with most admiration by my non-entomological friends.

The widely-spread insect *Atella Phalanta* is very abundant. It hardly varies appreciably from the Indian form in the imago, but the larva and pupa are very different in Natal from Horsfield and Moore's description of the Indian types. The pupa, especially ornamented with coral-red spines and marks and gilt spots, &c., is as beautiful as any I have ever seen, quite eclipsing the glittering *Danaidæ* both in delicacy and brilliancy of colour and harmony of form. My first discovery of the larva of this insect was by noticing a female egg-depositing. I watched her, marked the sprays, found the eggs, and visited them from time to time till the larva emerged, and so on till their pupa stage was reached; meanwhile—having obtained a clue to the food-plant, which much resembles our hazel—I soon found other larvæ, and bred a good series. At some periods of the year the imago is much darker than at others, following the law already set down concerning some *Anthocarinæ*. The size of this insect varies very much, and to this circumstance I trace the apparent rarity of an allied insect *Lachnoptera Ayresii*. This was first taken by Mr. Bertie Ayres, of Pine Town, and is allied to a West African form. I subsequently captured both male and female. In each case I took them on the wing, and believed them to be, as I struck at them, only large specimens of *A. Phalanta*. Their habits are precisely similar; I have no doubt that if *Atella* were carefully hunted the pursuit would yield a series of *Lachnoptera Ayresii*. The male differs from the female by having a lead-coloured patch on each of the hind wings. The female has handsomer and richer colouring than *A. Phalanta*, and the markings in black festoons are very elegant.

That most universal and at the same time beautiful insect, the "painted lady," is found as freely in Natal as elsewhere. It occurs throughout the year, and the brooding seems to be continuous. The larva, which differs very slightly in its markings in the male and female forms, feeds on a "common weed," apparently of the *Urticaceæ*. The insect has sometimes a strong roseate shot over the whole surface of its wings, not interfering with the ordinary markings, which makes it very beautiful.

Allied to the preceding and to our well-known English "admiral" is a very handsome and somewhat rare butterfly, with brilliantly coloured upper-wings, red, white, and black, and with a deep subtly coloured underwing of most marvellous richness and intricacy of pattern. This is *Pyrameis Hippomene;* it is present, I believe, in two varieties, is a somewhat solitary wood-haunting insect, and is difficult to meet with, but is constant in its special and favourite spots; I do not know anything of its transformations. In common with many of the *Nymphalidæ*, the male and female differ in the tails on the hind wings, but not to the same extent as is elsewhere observable.

The conspicuous and at the same time interesting genus *Diadema* is fairly represented in Natal; the mimetic tendencies of the genus are well exemplified in each insect; *D. Misippus*, with its brilliant male and ochreous female mimicking *Danais Chrysippus; D. Anthedon*, with its attendants, *Varia, Mima* and *Dubia*, which seem, although so diverse in colouring, to be only mimetic varieties of the first, aping *Papilio Leonidas* or *Danais Echeria*. Of *D. Misippus* I have bred several specimens, the larva being a spined one, black throughout, and with two longish and decided horns on the head; each segment is much constricted. The pupa is short and rounded, and highly decorated with grey striæ and blotchings, no doubt as a protection, being very like the bark of stems, &c, to which it is attached. All those I reared were males, so that I cannot tell whether there is a sexual variation in the larvæ. They feed on the leaves and flowers of a composite plant. The insect in its larval state, as in the case of *A. Phalanta*, presents great variation from that figured and described as the Indian one by Horsfield and Moore. The handsome and somewhat rarer *D. Anthedon* I reared from some larvæ I collected on a true nettle growing by water. Although larger, they are very similar to those of *D. Misippus*, but had white rings round the body on each segment. The spines were long, horny, and divaricating, but not urticating; the horns on the head were also present. Although I made special hunts on the food-plant for the larvæ after I had found the first two or three, with the hope of rearing a good series, in order to set at rest if possible the relations between *Anthedon*, *Varia*, and *Mima*, I was unsuccessful in getting more than one poor "beastie," and that was delicate and died. The haunts of the imago always showed me patches of the nettle food-plant growing in the damp, and *Mima* and *Anthedon* were present in about equal abundance, so that I hope, by hunting the nettle patches, some Natal resident will manage to work out the problem I had myself wished to do, and probably breed a series of both these insects from *one brood* of eggs.

Perhaps the most special feature of Natal Nymphalids is the development of the genus *Junonia*. *J. Anacardii* (peculiar to Natal), the "mother-of-pearl butterfly," is the largest and most brilliant; it is a lovely object floating lazily in mid-air in high sunlight, and well deserves its colonial name. The falcation of the wing is very marked, and varies considerably, as does also the size of the insect and the purity of its colouring, which is occasionally so suffused with brownish black as to present the appearance of a new species. It is a wood-haunter, and is not at all uncommon. The capture of two or three of these butterflies is one of the first features of moment in a collector's visit to Natal, for being conspicuous, they are tempting; being just out of reach, they are exasperating; and being very beautiful and large, they are gratifying when caught.

The larva of this conspicuous insect is, so far, unknown, but from its large size it ought not to remain so long. Judging from *J. Natalica* and *Œnone*, it should be spined and horned, and of a sombre colour, probably not unlike one of the spined *Saturnia* larvæ. I never, by watching the imago, got any clue to the food-plant.

The other species of this genus, *Junonia*, may be subdivided into several groups.

The first group is composed of open country varieties, and as developed in Natal, presents such remarkable intermediate forms between several of its members—*e.g.*, between *Amestris* and *Octavia*, *Archesia* and *Pelasgis*, *Archesia* and *Natalica*—that it will be a very pretty problem for the field naturalist to solve their relations, and one which the cabinet entomologist finds himself quite at a loss to deal with. As the perfect insects are all abundant, the larvæ should not be difficult to obtain and rear; that of *J. Amestris* has already been reared by Lieut. H. C. Harford, but no notes on variation were made.

The next group includes *J. Œnone*, a grass butterfly, *J. Clelia*, and *J. Orithya*, which almost appears to be a suffused variety of *Clelia*. The latter insect lives among low scrub and bushes on the coast lands only, whilst the two former are found also on the high grass-lands away from the coast. The transformations of both *Œnone* and *Clelia* are known; I reared several of *Clelia*, and found distinct sexual variation in the caterpillar markings, but to a very modified extent, consisting in the presence of a grey lateral thin line or stripe, below the insertion of the lateral spines.

J. Ceryne is a very variable butterfly; in its form it much resembles *J. Anacardii*, but it is a low flyer, flitting on low bushes or dusty roads. Its variations of colour, I think, are generally traceable to darker or ochreous suffusion obliterating the ordinary markings. It is common in the winter on the coast.

J. Cloantha, a bright butterfly with black festoons and markings, which have a blue shot in certain lights, presenting a very handsome contrast to the ground colour of red ochreous, is very common on the grass-lands up-country, and is specially a winter or late autumn butterfly. In fact, the whole of the *Junoniæ* are more strongly present in late autumn and winter than in the summer.

The typical Nymphalid is sufficiently developed in Natal in *Charaxes* and *Nymphalis* to brighten up a cabinet and heighten a collector's enterprise. The species which fell to my net in two seasons were *C. Ethalion*, *Brutus*, *Cithæron*, *Pelias*, *Candiope*; *N. Jahlusa*, *Zoolina*, and *Neanthes*. These, without exception, vary, in the tails, between male and female. They are all to be caught feeding on mimosa gum or sap as it exudes from the stem in the hot sunlight, sometimes at distances sufficiently away from the ground to make it a matter of aggravation to the pursuer that his game is quite content, despite all his challenges with bits of paper, showers of sand, &c., to stop and sip the nectar, and pay no attention to the mortal below.

They stick most pertinaciously to these exudations, and sometimes require almost to be "poked" off. But when they do move, it is so suddenly, that very often the net is quite behind, and the opportunity is lost. To increase the difficulty of capture, this exudation is most specially delightful to them when it is from the bark of a rough and very thorny mimosa, which is perfect ruin to nets and temper. However, experience and patience, as in everything else, does it, and by a little attention and several trials the insects can be taken with certainty, as they are very bold, and return continually to the same spot, however often they may be disturbed.

The most remarkable dissimilarity between the sexes, which is not confined to the tails, is the case of *C. Ethalion*, the male being black and smaller than the female, which is black, with white bars and spots and purple blue marks on the upper sides of the wings, though the under sides are nearly identical. The under sides of all the *Charaxes* are handsome, especially *Brutus* and *Pelias*, which are silver veined and very brilliant and rich. *C. Jahlusa* also has silver marks, but in dots and splotches, like our English Fritillaries. *Candiope* is a very handsome red-brown butterfly, with bright green veins, &c. *Pelias*, which is very local, is also red-brown, but without green veins. *Candiope* haunts bush paths by the coast; *Pelias*, mimosa scrub on hill-tops inland. *Ethalion* loves scattered bush near grass-land. *Brutus*, like *Candiope*, is a bush lover; and so is *Cithæron* generally, although specially affecting orange groves. *Jahlusa*, with its silver-spotted under side, is not found freely coastwards, but in kloofs and bushes up-country. *Zoolina* and *Neanthes*, which, except for the fact that *Zoolina* is white and *Neanthes* ochreous, are identical in markings, habits, and sexual differences, and appear to be a variety of one another, are coast butterflies, haunting low mimosa trees in glades, or waste scrub, or rows of "bois noir," a mimosa that has been introduced into Natal, and is often planted on sugar estates as a margin to roads.

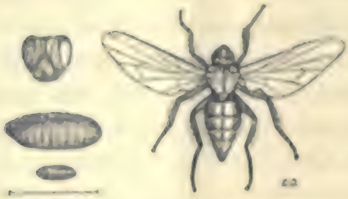
The metamorphoses of these insects are not at all well known. I reared *Cithæron* and *Brutus* from the larvæ, but did not obtain any others. The larvæ in these cases were somewhat slug-formed, with very pronounced heads, green with a rough skin, and with delicate blue markings and edgings. They differed sexually in both instances, and the head had four or more short irregular processes or horns, edged and tipped with colour. Of *Brutus* I only bred a few, but of *Cithæron* many. The sexual difference of the latter was that the females had a large dorsal sub-cordate cream mark which was wanting, or only shown by a dot, in the males, and the colour was more vivid in the edgings to the frontal horns. *Brutus* had pale, oblique, lateral lines, in the reverse direction to those on the sphingiform caterpillars.

The next genus, *Pseudacræa*, has already been referred to several times; it is a small family, consisting of only *P. Tarquinia* and *P. Boisduvalii*. I believe another, *P. imitator*, is added in Mr. Trimen's list, but I have not seen it, and am inclined to think that as *P. Boisduvalii* is imitative in both its sexual forms of *Acræa Acara*, so the two forms, *P. Tarquinia* and *imitator*, are imitative of sexual differences of *Acræa Aganice*, and are sexual vars. of the same insect. It lives apparently on sufferance by its imitative powers of the odious *Acræidæ*. When present on the wing, I have always found it in company with its patron. I am unaware of its transformations, but should not be surprised to find the larval state also an imitative one of the *Acræa* family.

(To be continued.)

THE MANGOLD-FLY.

By Edward A. Fitch.



Chortophila betæ.

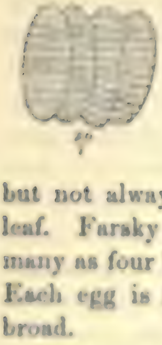
It is not long since one of the arguments advanced in favour of mangold culture over that of turnips or swedes was the immunity of the former root-crop from insect attack; and it is but few years since our agricultural text-books gave this crop as altogether free from these pests. The experience of the last two or three years has produced quite an opposite conviction. Mildew or louse (*Rhopalosiphum dianthi*), the nigger or turnip-sawfly (*Athalia spinarum*), have hardly put in an appearance, and the "fly" (*Phyllotreta undulata*) has not been specially troublesome amongst our turnips and swedes; while, on the contrary, the young mangolds have everywhere suffered severely from wireworm (*Agriotes lineatus*, *Athoüs niger*) and *Tipula* grubs below the surface, and from caterpillars just above (*Agrotis segetum*, *A. exclamationis*). Amongst the Coleoptera *Silpha opaca*, *S. lævigata*, *S. atrata*, *Atomaria linearis* (both here and on the Continent, especially so in 1875 and 1876), *Tanymechus palliatus*, *Cleonus sulcirostris*, *Gastrophysa polygoni*, *Cassida nebulosa*, and one of the *Halticidæ*, are all occasional destructives. The soft, pale brown, tuberculate, six-legged, antenniferous larva, and the pretty beetle, with its dark steel-blue elytra and red thorax, of *Gastrophysa polygoni*, have been destructive to the mangold leaves this year in several localities, more especially in the West of England. *Tanymechus palliatus* and *Cleonus* (*Bothynoderes*) *punctiventris* have been particularly destructive in Russia.

This year we have one of those inexplicable spasmodic attacks, of some species not generally noxious, amongst the mangold crop throughout the kingdom. It has been more especially injurious in the North of England. The mangold leaves have been blistered, and eventually destroyed, through the small larva of a dipterous fly feeding on the pulp between their cuticle. Whole fields have been completely scorched up, as it were, from their attack.

The mangold-fly—*Anthomyia* (*Chortophila*) *betæ*—was first brought into notice by Curtis. He described the male in the part of the 'Journal of the Royal Agricultural Society' published in December, 1847, from specimens received from Mr. F. J. Graham, of Cranford, who related its economy as observed in Surrey. Until this year I am aware of but one other recorded occurrence—at Castlewellan, Ireland. On the Continent its injurious effects have been repeatedly observed in Germany (Scholtz, Nördlinger, Taschenberg, Fichtner, and Farsky); also in Sweden by Holmgren.

In Mr. H. J. Little's report on the "Cumberland and Westmoreland Farm-prize Competition, 1880," in the just published part of R. Agric. Soc. Eng. Journal, we now read:—"Part of the peat-land was planted with mangolds, but, like all the crops of that root in this country, they were very indifferent, having suffered from the maggot which seems to infest the North of England. This creature settles in the leaves, eats out their ribs, and entirely prevents growth. We did not find a piece free from its ravages in the two counties" (l. c. xvi. 549). This is on the fen-like soil of Mr. Donald's Sanden House Farm, near the shore of the Solway Firth. In writing of Mr. Kitchen's heavy land, upland, Farm, near Calthwaite, in central Cumberland, which is over 500 feet above sea-level, Mr. Little again says:—"A small quantity of long red mangolds are taken, and, like all the rest in this county, they were affected with the grub in the leaf, before alluded to." In 1880 there were 1624 acres of mangold grown in these two counties, and this high authority says *all* were infested.

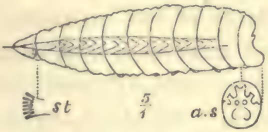
Many of the short crop reports in our agricultural and local papers have referred to this new pest; and I have heard of it from correspondents in Cheshire, Yorks, Notts, Norfolk, Suffolk, Essex, Herts, and Salop. The following practical references are from the pages of the 'Chamber of Agriculture Journal.' Mr. W. T. Carrington, of Croxden Abbey, Uttoxeter (North Stafford), says, "Mangolds are poor and irregular generally; the leaves are now (July 12th) much pestered by a maggot." J., writing from North Shropshire, in the same number, says, "Mangolds mostly destroyed by grub." From Cheshire a correspondent, writing on August 7th, reports that "Mangold is again suffering from the maggot in the leaf." Mr. T. Duckham, M.P., says of Herefordshire, "Mangold injured seriously by white grub in the leaf." The most entomological report hails from North Wilts. In the number for July 19th, W. P. J. A. writes, "Early sown mangolds have grown well, but are much injured by the maggot in the leaves, recently mentioned by your correspondents; nearly every plant is attacked, and some of the leaves appear scorched and shrivelled. I see several other large-leaved plants are similarly affected, as fat-hen, burdock, and docks. The latter plant has been liable to such attacks generally; however, I have noticed dock leaves affected in the same manner for thirty-five to forty years. Last year parsnips and celery were destroyed by this pest." This is enough to show the general distribution of the mangold-fly, and the noticeable injury it has everywhere caused. Now to the destructive itself.



The eggs are laid in little scattered heaps on the under side of the mangold leaves, between the ribs, generally about the end of May or early in June, and again in July or August. These are elliptical in form and snowy white in colour, but with a strong glass they show a honeycomb-like, hexagonal pattern, as seen in the figure, which is copied from Farsky. As is very general in Diptera these eggs are attached together by means of a gummy substance, more often longitudinally, but not always; this viscous nature also attaches them to the leaf. Farsky found from four to eleven eggs in a batch, and as many as four batches on a leaf; but this is probably exceptional. Each egg is from ½ to ¾ of a millimetre long, by about ¼ mm. broad.

As soon as hatched the young maggot bores through the lower cuticle of the leaf, and commences feeding on the pulp. It now feeds very energetically, and grows accordingly. The whole parenchyma of the leaf is often completely eaten, nothing but the thick midrib stopping the course of the larva. The leaf then presents a very bladdery or blotched and bleached appearance; it speedily withers up and dies, but does not drop off. The larvæ sometimes are found singly, but more often two or three feed in the same blotch, and where there were as many as eleven eggs laid together we should expect to find eleven larvæ in a leaf; from what we know of the gastronomic powers of a single larva, where this happens the struggle for existence must eventually be rather severe. Farsky gives the result of an experiment on the extent of leaf blotched by eleven larvæ transferred from affected leaves to a fresh one. In six hours the blotch measured twelve square centimetres, and in twenty-four hours fifty-eight square centimetres, but as in all insects the amount of food consumed in a given time varies greatly according to many circumstances.

The full-fed larva is about one third of an inch (7—9 mm.) long. It is apod, conico-cylindrical in shape, wide at its anal extremity, and tapering gradually from the 7th segment to the head; this carries two black retractile hooks. Westwood says "the mouth of the larvæ of the genus *Pegomyia* is furnished with a corneous instrument in the shape of S, which moves round a small fixed point, enabling them to scrape up the soft parenchyma of the leaf." In colour it is pale yellowish white, showing greener towards its thickened extremity from the intestines showing through. This led Mr. Graham to describe the larva as greenish; its frass is dark green. A pair of stigmata are placed just before the second segment; Farsky shows them greatly magnified in his figure, which is here copied, and says they resemble a seven-rayed fan (magnified, *st*). He also figures and minutely describes the truncate terminal segment (magnified, *a.s*); on the dorsal sloping part are four twin, fleshy appendages; in the centre below these are two papillæ, with two more spiracles; there are two very inconspicuous protuberances on the ventral surface. It is therefore an amphipneustic larva, according to Haliday's classification. When full-fed the larva generally eats its way out of the leaf, and pupates in the ground, but occasionally this takes place within the leaf, as did the specimens described by Curtis. Mr. F. Norgate says he finds the pupæ about three inches below the surface, and again, "I cannot find a single pupa in the leaves, nor have I induced a larva to pupate in a leaf, but believe this always takes place underground." It might be thought that Curtis refers to a distinct species, but Farsky specially tells us that from his experimental leaf some pupated underground, while others did



so in the leaf. I believe this is common with many leaf-mining Diptera.

The hard, coarctate pupa is from 5 to 6 mm. long, and of the shape usual with the typical *Muscidæ*. It is oval, slightly wrinkled, segmental divisions very indistinct; reddish brown in colour, slightly darker towards the head (see figure, heading article).

C. betæ hybernates as a pupa, though when bred the imagos are often produced in the late autumn. Farsky tells us that his second brood pupated about the 20th and 21st of October, while the imagos appeared at intervals from 10 to 105 days (4th February). Hence we find that barren specimens may be produced in the autumn, but pupal hybernation is natural. The flies are produced from March to May; the egg state lasts from a week to ten days; as larvæ they live about a month, and the first brood remain in pupæ from ten days to a fortnight. There are normally two broods in the year, but frequently three or even more, where conditions meteorological and otherwise are favourable. In 1854 Nördlinger found young larvæ as late as October 1st. From Sparham, Norfolk, Mr. Frank Norgate reports the larvæ common in two fields on June 20th. Mr. Nelson's twenty acres were "set back about three weeks by the attack, and the headlands suffer least." On July 1st he dug twelve pupæ, which emerged from 7th to 13th. On August 1st he reports, "saw plenty of ova on under surface of mangold leaves. Their larvæ are now more numerous than ever, and the whole field looks brown with dry and blistered leaves;" and again, on September 29th, "Mr. G. Forby, of Sparham, tells me his mangold are now fresh 'blown' by flies, and are set back by them." This appears to point distinctly to three broods in Norfolk this year, and the Cheshire correspondent already quoted reports a second attack, or brood, in August. Mr. Graham's specimens, quoted by Curtis, were larvæ on 26th June, and the imagos appeared from July 17th to 20th. The great attack this year throughout the country was in the first fortnight of July. Mr. Inchbald says the fields around Bridlington were attacked in July and August. Mr. Norgate's copious notes were contributed for Miss Ormerod's 'Injurious Insect Report,' to whom I am indebted for them, as well as the drawing at the head of this article. In this year's 'Report' the mangold-fly is also reported from Slogarie, Kirkcudbright, by Mr. Service; from Churbrook, Cheshire, by Mr

Fitton; from Church Stretton, Shropshire, by Mr. S. Harley Kough; from Ballinacourt, Tipperary, by Mr. Sym Scott; and from Dromore Castle, Kenmare, Kerry, by Dr. R. J. Mahoney.

The mangold-fly belongs to that immense Dipterous family, the *Muscidæ*; Schiner describes 359 genera, and there are many others occurring in Europe. It is included in the subfamily *Anthomyiidæ*. This division includes a whole host of species, so closely allied that they are particularly difficult to separate. Their economy is very variable, the larvæ feeding on vegetable or animal matter, dead or living. Of the phytophagous species some feed in bulbs, roots, or stems, as the well-known onion flies (*A. platura*, Meig.; *A. antiqua*, Meig.=*ceparum*, Westw.; *A. furcata*, Bouché); the too common radish fly (*A. floralis*, Fallen); and the cabbage flies (*A. radicum*, L.; *A. ruficeps*, Meig.; the compound *A. brassicæ*, &c). One species is very destructive to lettuce seed (*A. lactucæ*, Bouché). Of leaf blotchers there are several, mostly imperfectly known and with their synonymy greatly involved. Field naturalists and systematists do not always work together. These leaf-feeders generally have yellow abdomens, and are included in Macquart's genus *Pegomyia*, to which his *Chortophila* is very closely allied, but this includes the dark-bodied species. The common dock leaf miner is *P. mitis*, Meig., Macq. = *rumicis*, Desv. *P. bicolor*, Wied., similarly blotches other species of *Rumex*. *P. hyoscyami*, Panz., Macq., affects the henbane, and our species of goosefoot (*Chenopodium*) and orache (*Atriplex*) are blotched by a species doubtfully distinct from it; Goureau called this *P. atriplicis*, and Rondani *P. chenopodii*. This brings us into very close proximity with our mangold species; the botanic genus *Beta* coming between *Chenopodium* and *Atriplex*.

(To be continued.)

NOTES FROM TAYNUILT.

By Reginald E. Salwey.

I had the opportunity of spending three weeks in Taynuilt, Argyllshire, last June, and have extracted a few notes from my diary of my entomological doings there.

Taynuilt is a scattered village situated about half-way between

Dalmally and Oban, and is now accessible by the extended line of rail between the last-mentioned places. The scenery is most impressive between Dalmally and Taynuilt, which is approached through the wild and gloomy Brander Pass,—

> "Where rocks were rudely heaped and rent
> As by a spirit turbulent,"

and through which flows the short but very picturesque River Awe, connecting Lochs Awe and Etive, a stream dear to anglers, but which proved singularly unproductive last season; to this fact my brother and many fishermen can testify.

I commenced operations with my net by the margin of the river, on whose farther shore Ben Cruachan stands majestic. Here in a succession of fields I found *Tanagra chærophyllata* and *Emmelesia albulata* very plentiful; and in one limited space *Procris statices* abounded. Farther on, where the ground was uncultivated, *Melanippe tristata* and *M. subtristata* rose in numbers as I pushed through the ferns; and a little promiscuous beating among stunted bushes overhanging the river produced a few other species of Geometræ, viz., *Acidalia fumata*, *Numeria pulveraria*, and *Cidaria corylata*. Owing to the want of variety in foliage the woods round about did not prove very productive; but following the course of the little River Nant, which meets the Awe at Taynuilt,—and is by the way a capital trout stream,—I devoted several dull mornings to beating the copse wood for two miles up stream, and thus made several additions to my list of Geometræ, but none of importance: *Ephyra punctaria*, *Melanippe hastata*, *Cidaria populata*, and some pretty forms of *Boarmia repandata*, intermingled with commoner species, such as *Larentia pectinitaria*, *Lomaspilis marginata*, and *Melanippe ocellata*, were the result of my labours,—an insufficient reward for the invariable arm-ache and occasional drenching with which I returned to the hotel. Just before leaving the locality I discovered a birch wood where *Metrocampa margaritata* abounded, as many as five specimens responding on one occasion to a single blow of the beating-stick. Evening netting procured for me specimens of *Emmelesia affinitata* and *E. blandiata*, *Larentia salicata*, *Miana arcuosa*, and other common species of Geometræ and Noctuæ.

The dearth of butterflies seemed remarkable to me after my southern experience. Of this group *Argynnis Aglaia* proved the most abundant and interesting. On June 18th I came upon a great number flying along a slope on the moorland, mostly fresh from the chrysalis. The males were remarkable for the intensity of their colours, and the females for their great size and rich brown hues, some suffused almost to blackness. I netted a pretty variety of the male in which the usual markings of the anterior wings are superseded by graceful black lines. A dingy type of *Chortobius Pamphilus* was fairly plentiful everywhere; *Lycæna Alexis* scarce; a few *Argynnis Selene* turned up in open spaces of the woods; and on June 19th I took a couple of *Melitæa Artemis* in a marshy field: they were literally worn to shadows, but I fancy the species would have proved plentiful there at the end of May. A solitary granite boulder jutting out from the interminably heather-clad moorland seemed to be a favourite resting-place for some species. Here in a space of about sixty yards square I secured a few fine and strongly-marked *Satyrus Semele;* also *Zygæna filipendulæ*, some with confluent spots; and in their company two solitary *Z. nubigena*; also *Dasydia obfuscata, Larentia cæsiata, Anaitis plagiata.* Some tolerably dark *Cidaria russata* sitting close on the rock, but sufficiently wary to fly off at my approach, also occurred here; but owing to the nature of the spot were easier to see than to capture.

Perhaps my most successful effort was sugaring. I had little more than a week of it, as towards the close of my stay the weather turned out something more unpleasant than the proverbially "saft," and night-work was out of the question. However I managed to obtain thirty-five species of Noctuæ by this method of capture, among which my best takes were *Aplecta occulta, A. herbida, A. tincta, Hadena rectilinea,* and *Acronycta leporina.* My southern experience made the northern forms of many of the common Noctuæ appear very novel. Notably so was *Hadena pisi,* tinged with grayish blue, and *Aplecta nebulosa* in some instances nearly white and almost without markings. *Xylophasia rurea* var. *combusta*, and black and brown *X. polyodon,* naturally occurred, while *Hadena adusta* proved a nuisance. In consequence of the northern latitude, sugaring in June at Taynuilt necessitated late hours, and my first round was never attempted before half-past ten; but as I found suitable posts at the back of a copse, within five minutes' walk of the hotel, this did not matter.

The locality is too near the sea-level to afford a chance of capturing the mountain butterflies, or such insects as *Noctua sobrina* or *Pachnobia hyperborea;* but I am of opinion that a climb and investigation of Ben Cruachan would prove profitable. This I did not attempt, as I was looking forward to a short visit to Rannoch, where I afterwards obtained *Erebia Cassiope* and *Chortobius Davus* in plenty. Putting aside the natural beauty of the spot, I am inclined to think Taynuilt would prove worthy of something better than the desultory working I was able to give it.

I know of no other accommodation there beyond the hotel, which is commodious and comfortable.

Auburn Villa, Putney, December, 1880.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Vanessa Antiopa.—I am pleased to be able to hand you another instance of the capture of *Vanessa Antiopa*, which I took near Aldershot, on August 20th, 1880, while it was sitting on an oak tree, which I had sugared on the previous night.—F. J. Galsworthy; 8, Queen's Gate, Hyde Park, London, S.W.

On the Geographical Distribution of Orgyia antiqua.—The subject of the geographical distribution of plants and animals is altogether too deep to be touched upon in a small paper, yet there are occasionally matters in connection therewith that present themselves to our notice, and that cannot be explained away with the facility that attends the disposition of many questions of this character. There is no doubt that, apart from the agency of Nature's laws, human assistance, or rather the results of civilisation, have conduced in no small degree to tend to distribute not only plants, but quadrupeds and insects. The Norwegian rat, which has entirely replaced the English rat, is a strong proof of this; and the constant appearance of tropical Coleoptera at docks and similar places bears out the argument. But how are we to account for the almost universal distribution of the wingless-wifed *Orgyia antiqua*, or in fact any of the Lepidoptera whose females are apterous; human agency in this case will not bear consideration, as we have no reason to suppose that its existence here or on the Continent dates from any particular historic time. Again, it is quite out of the question to imagine that its female was ever, even under the most favourable circumstances, blown across the silver streak; for not only is its ponderous body incapable of such a feat, but it usually deposits its eggs on the exterior of its cocoon, so that it would not therefore present a chance of being caught by the wind. Had the larva been a smooth one, or even had the eggs been a suitable food for any bird, animal, reptile, or fish, a reason might possibly have been traced for distribution in this manner; but the larva is hairy, and perhaps no insect is so little molested as *Orgyia antiqua* in any of its stages. How then has this insect become so widely distributed, whose eggs are deposited on the cocoon of their mother's pupa, and whose larvæ crawl to the nearest food to begin the battle of life. The argument may be put forward that it took place before the present arrangement of the Continent and islands,—in fact when these islands were part and parcel of the rest of Europe; but if this were so, how did it survive the great climatic changes which attended and followed that period. It could not have done so, and the question remains: How are we to account for the great distribution of those Lepidoptera whose females are apterous, and whose larvæ are not molested by other creatures?—E. LOVETT; Croydon.

ODONESTIS POTATORIA, *var.*—The variety in the male of this species of the pale yellow colour of the female, as recorded by Mr. Bowyer, in the December number of the 'Entomologist' (Entom. xiii. 310), is of rather frequent occurrence in Wicken Fen. The great majority, too, of the females I bred from larvæ brought from Wicken last June were of a much paler and duller yellow than in the ordinary type of the species.—GEO. T. PORRITT; Highroyd House, Huddersfield, December 4, 1880.

ODONESTIS POTATORIA, *var.*—As all records of varieties are worth noting, I wish to mention that I bred this summer, from a very small batch of larvæ, a good variety of *Odonestis potatoria*, a female, having a near approach to the colouring of the male, the wings being of a very dark shade, and the general markings resembling the usual decided character of the male insect.—ED. LOVETT; Holly Mount, Croydon, December, 1880.

RARE LEPIDOPTERA AT LIGHT.—While returning from an unprofitable sugaring excursion on the sandhills here, last

September, I took a fair specimen of *Laphygma exigua* from a street-lamp. I find that in this neighbourhood the lamps often repay a visit. Among sundry things I have captured from them, at odd times, I find I have taken *Ennomos alniaria*, *Deiopeia pulchella*, and *Leucania vitellina*—R. Harbour; 1, Landport Cottages, Deal, November 24, 1880.

Aplecta occulta near Whitby.—Towards the end of August my brother and I were fortunate enough to catch two specimens of *Aplecta occulta*, one in very good condition, at Whitby.—C. Dashwood Snell; St. John's College, Oxford, Nov. 18, 1880.

Abraxas grossulariata double-brooded.—In referring to my diary I find the following:—"November 1st, 1874, a friend of mine, Mr. Holden, brought me three pupæ and three larvæ of *Abraxas grossulariata*. He took them from a celery plant, and there were neither gooseberry nor currant bushes in the garden where they occurred. The insects emerged from the pupæ on November 25th, but they were in no way different from the normal type, except a little smaller. The three larvæ died."—W. Johnson; 66, Upper Warwick Street, Liverpool, Dec. 8, 1880.

[The late Mr. Chapman, of Glasgow, visited Ailsa Crag some years ago, and found *Abraxas* larvæ feeding in numbers upon *Cotyledon umbilicus*. If we remember rightly they produced the ordinary form of *A. grossulariata*. Of course navelwort is more nearly allied to the *Ribesiaceæ* than is celery.—Ed.]

Notes from Ranworth Fen.—The last twelve days of August I spent in the neighbourhood of Ranworth Fen. My stay was not by any means a successful one entomologically, the paucity of nocturnal Lepidoptera being very marked, and nothing but common species falling to my lot. Although the weather was on the whole satisfactory, I saw little or nothing on the wing, in the way of moths. I sugared the alder-bushes by the "Broad," and in other parts of the fens, with little success; some nights, although favourable to all appearance, yielding but few insects, and many of those that did come were worn. *Noctua xanthographa* was on some nights a complete pest, and *N. rubi* pretty abundant. I took a few *Apamea fibrosa*, but not in very good condition, accompanied by such species as *Amphipyra tragopogonis*, *Mania maura*, and other species not worth naming. Two nights' sugaring in a large plantation near the Broad at South Walsham, where I anticipated great things, judging from the aspect of the place, only yielded a few *Tryphæna janthina*, *Noctua rubi*, &c. I also netted *Leucania phragmitidis*, *Lithosia stramineola*, and a few *Epione apicaria*. Such are the meagre results of a fortnight's work in this part of the fens; I trust notes from other localities may be of a more cheering nature.—ROBERT LADDIMAN; Norwich, September 6, 1880.

VARIETIES OF LEPIDOPTERA.—I have taken a fine variety of *Chortobius Pamphilus* this season, apparently fresh from the pupa, the whole of the wings, except the fringes, being of a clear whitish brown; this I took at Harrow, on the Pinner Road. I also took four very fine specimens of *Paraponyx stratiotalis*, one of them, a large female, with almost all the blotches running into one, making it look like a totally different insect.—F. SHARP; 16, Huntsworth Terrace, Edgware Road, W., Nov. 8, 1880.

HOW INSECTS CROSS THE CHANNEL.—Wishing to examine one of the means of transport offered to insects across the Channel, I searched the steamers on a recent voyage both going to and returning from the Continent. On my voyage I had the good fortune to find two *Bryophila glandifera*, one *Triphæna pronuba*, one *Cosmia trapezina*, one *Xylocampa lithoriza*, besides several bees, wasps, &c. On my return I found three *Plusia gamma* and one *Mania maura*. These are of course only examples of what is usually taking place during the summer season. The continual importation of foreign specimens may have an effect on the lepidopterous fauna of the county.—J. H. LEECH; Shanklin, Oct. 9, 1880.

CAPTURE OF NOLA CENTONALIS.—While collecting on the south coast in August, 1879, I took two or three little moths, which I was afterwards informed were *Nola centonalis*. Being too late to take any more then, I had to wait another twelve months for it. So last August I thoroughly worked the locality, and succeeded in taking a few more, but they appeared very sparingly indeed.—R. HARBOUR; 1, Landport Cottages, Deal, November 24, 1880.

ACIDALIA OCHRATA BRED.—The ten pupæ mentioned in my notice of the larva of this species (Entom. xiii. 306) have all duly hatched. The first moth appeared December 2nd, and the last December 16th, all perfect specimens. The tone of colour is not quite so deeply ochreous as in the caught examples.—W. H. Tugwell; 3, Lewisham Road, Greenwich, December, 1880.

A New Eupithecia.—At the meeting of the Lancashire and Cheshire Entomological Society on December 20th last, Mr. Nicholas Cooke, of Liscard, Cheshire, announced that a moth which he had exhibited at the previous meeting was a *Eupithecia* undoubtedly new to Britain. The insect had been bred by Miss Greening, of Warrington, during July this year. This *Eupithecia* is easily distinguished from any other species of this genus in the list of British Lepidoptera by possessing a dorsal chain of nearly white spots on the abdomen; otherwise it appears closely allied to *E. lariceata*. In compliment to Miss Greening, Mr. Cooke proposed to give it the provisional name of *Eupithecia Blancheata*.—W. E. Sharp; Colonial Chambers, Liverpool, December, 1880.

Cedestis Gysselinella in England.—I have to record the capture of this rare Scotch Tineina as having occurred on this side of the border. I regret I cannot give the precise locality of its capture, for I am again suffering all the annoyance of finding some collector has either wantonly or carelessly well-nigh exterminated another local species, this last sufferer being the lovely little *Cidaria reticulata*. When I went to look for the larvæ of this species as usual this season, I was disgusted to find the very local food-plant, *Impatiens*, had been destroyed and pulled up, and this quite a month before seeding time.—J. B. Hodgkinson; 15, Spring Bank, Preston, December 6, 1880.

Crambus verellus at Cambridge.—In August, 1877, I caught a specimen of this *Crambus* at light amongst *C. falsellus*, which was common. The following year I caught three more in July, also at light. They have remained unnamed till this year, when a comparison with the figure given some years ago in the 'Annual' decided the question.—A. F. Griffith; Cambridge, December, 1880.

Occurrence of a New British Trichopteron.—At the last meeting of the Glasgow Natural-History Society I exhibited specimens of *Molanna palpata*, M'Lach., a species of caddis-fly new to Britain. It has hitherto been known only from Finland and Siberia; and a specimen from St. Petersburg was found among Kolenati's types of *M. angustata* in the Vienna Museum.

The remarkable form of the third joint of the maxillary palpi in both sexes at once distinguishes it from its congeners. The above species was taken during my stay last summer at Cannich, Strath Glass, Inverness-shire, and occurred commonly all through August. It was the common caddis-fly at all parts of the Strath visited by me. I found it among the margins of lochs by brushing, with the net, the overhanging heather, &c. I cannot remember having seen it flying without its having been first disturbed. *M. angustata*, De Geer, is the only other British species of the genus.—J. J. KING; 207, Sauchiehall St., Glasgow.

ADDITIONS TO THE CASUAL INHABITANTS OF GALLS (see Entom. xii. 113, and xiii. 252).—From pierced galls of *Cynips Kollari*, collected during winter, I bred in May last four specimens of *Coniopteryx tineiformis*, Curt., and three of *Cemiostoma Wailesella*, Staint. As many of the galls occurred at a waste border of a field likely to be inhabited by *Genista tinctoria*, and some of them on twigs only a few inches from the ground, they might have been well over-topped by this plant. I am unable to assert that the plant grew there, but suggest this to account for the presence of the moths. For remarks on the pupation of the *Coniopteryx*, see Westwood's 'Introduction,' ii. 49. From a gall of *Andricus terminalis* I bred, April 4th, a specimen of *Hemerobius nervosus*, Fab. To my disappointment these were the only interlopers I bred.—J. E. FLETCHER; Worcester, November, 1880.

SCIATHERAS TRICHOTUS, *Ratz.*—In my notice of the *Chalcididæ* parasitic on *Calandra* (*Sitophilus*), Entom. xii. 47, I gave the curious tufted-winged species as *Cerocephala formiciformis*, with the string of synonymy almost as copied from Foerster (Hym. Stud. ii. 41). I then felt nearly certain that my specimens, winged in both sexes, could not be the same as the apterous species figured by Haliday. Just lately Mr. E. A. Butler has sent me a plentiful supply of the true *Theocolax formiciformis* in both sexes. These were shaken from the old *Anobium*-eaten wood of an aquarium-stand, and it is certainly parasitic on *Anobium*, as given by most authors. This showed me that my corn-weevil parasites were a distinct species, and they certainly are Ratzeburg's *Sciatheras trichotus*. While looking up the numerous synonyms, and failing to find a copy of Westwood's early paper, published in the 'London and Edinburgh Philosophical Magazine,' the Professor referred me to his 'Thesaurus Entomologicus Oxoniensis.' There these three interesting and somewhat aberrant genera are clearly differentiated. Although abundantly distinct, Foerster had treated them as synonyms; and Dr. Reinhard gives *Sciatheras* as a synonym of *Cerocephala*, saying that from the peculiar structure, especially of head and wing, there can be no doubt of their identity (Berl. Ent. Zeit. i. 75). Ratzeburg's *Sciatheras trichotus* ('Die Ichneumonen,' ii. 209, pl. iii., fig. 1) is described by Westwood as new, under the name of *Chætospila elegans* (Thes. Ent. Ox., p. 137), and beautifully figured, with several details, on plate xxv., fig. 10; this from an old specimen given him by Mr. Raddon, who bred it from maize, where undoubtedly, like my specimens, it was parasitic on *Calandra*. However, Ratzeburg's single specimen was in all probability parasitic on *Hylesinus fraxini*. He speaks of it as "the most remarkable of all the *Chalcididæ*." In the 'Entomologist' (Entom. xii. 47) *Cerocephala formiciformis*, Westw., Walk. (et synonymia), should be altered to *Sciatheras trichotus*, Ratz. (= *Chætospila elegans*, Westw.)—E. A. Fitch; Maldon, Essex.

Unusual abundance of certain Insects.—If we may judge from accounts that have appeared in newspapers and magazines, the year 1880 will be notable for the occurrence of certain insects in unusually great numbers, both at home and abroad. My own experience is also in the same direction, as the following notes from my pocket-book will show:—June 25. To Birchland Wood for afternoon's collecting. Beset by hosts of small flies and brimps (*Tabanidæ*). Soon driven from the wood. Six brimps on my legs at one time. Was never so set upon by flies before, and should not have thought it possible in this country. The day was sultry and storm-like, and insects appeared ravenous. The instant I stopped to examine a plant or the contents of my net, two or three common flies attacked each eye and the corners of my mouth; several paid the same attention to my hands, while the brimps did their utmost to draw blood from my legs. Under these circumstances, I acknowledged myself beaten, and retired. —July 1 to 14. Several notes of my horses being terribly bitten by brimps, when at work. The animals were almost unmanageable from the continued torment, their sides being often spotted with blood-drops.—July 20. Horses rendered so restive from brimp-bites while mowing, that one was sent home as beyond control.—

August 26. A sultry day. Myriads of thrips, borne on puffs of hot air. I attended Hamstreet Lamb Fair, and the hundreds of handkerchiefs in hand removing the "ticklers" from the face and neck of the owner was a remarkable sight. At certain times far more attention was paid to hexapods than to quadrupeds. Besides the above I may mention that here, as elsewhere, wasps were more plentiful than they have been for many years past; aphides abounded on everything green, and caterpillars were so numerous as to threaten the very existence of all the cabbage-tribe in my garden. My window-panes have been striped with the ladders made by the larvæ of *Pieris rapæ*, when seeking a place to pupate, and on one day I destroyed no less than two hundred and forty-five larvæ and pupæ of this species round my windows and doors.—THOS. H. HART; Kingsnorth, Kent, Oct. 26, 1880.

SIREX GIGAS AT SUGAR.—One evening in August, while sugaring for *Aplecta occulta* at Sandburn, in York, I was rather startled to see a large and perfect specimen of *Sirex gigas* enjoying herself on the sweets I had prepared for my other visitors. Is not this a very unusual occurrence?—W. PREST; 13, Holgate Road, York.

HORNETS IN NORFOLK.—My garden here has been full of them all the summer, and they and the wasps between them devoured certainly half of a magnificent crop of plums. I find several of the hornets every night on my sugar, and one morning I discovered a handsome nest of them in a loft. It hangs suspended from a beam, and is about the size of a moderate pumpkin. If you or any of your correspondents can tell me how to destroy the insects without injuring the nest I should be greatly obliged.—R. S. STANDEN; The White House, Alby, Norwich.

HAGGERSTON ENTOMOLOGICAL SOCIETY. — EXHIBITION. — The Annual Exhibition of the above Society was held November 25th last. The exhibits were confined, with few exceptions, to the captures of the past season. Amongst the more striking boxes shown we remarked the following:—Mr. J. W. Jobson, two cases of Lepidoptera taken in the New Forest, and long series of *Stauropus fagi* taken in Epping Forest. This exhibit was notable for the remarkably fine condition of the insects and the care used in preservation. Messrs. Pearson, T. Eedle, H. Barnes, C. H. Williams, and Jobson showed some very beautifully preserved larvæ and life-histories of Lepidoptera. The latter exhibitor's larvæ included that of *Acosmetia caliginosa*, reared from eggs, and we believe identified for the first time. It was impossible not to observe the remarkable improvement upon the last Exhibition in the preservation of larvæ. Mr. Boden showed a series of *Peronea caledoniana*, taken in Kent; Mr. Meek a series of *Eupœcilia thuleana*, Vaughan, recently added to the British fauna. Mr. Mardle brought a fine melanic variety of *Hemerophila abruptaria*, and Mr. Eedle a dark form of *Botys urticalis*; Mr. W. J. Harper a fine series of rare moths, including *Plusia bractea* from Lancashire, *P. orichalcea*, *Dasycampa rubiginea*, *Acronycta strigosa*, *Cymatophora fluctuosa*; Mr. Southey two drawers of Lepidoptera, chiefly from Highgate, in which we noticed some fine *Eupithecia dodoneata*. Mr. J. A. Clark showed the specimen of *Chærocampa celerio* taken in Hackney, which was recorded in error at p. 241, vol. xiii., of Entom., as *Deilephila livornica*; also some fine varieties of *Boarmia repandata* from Highgate. Mr. Ernest Anderson showed a portfolio of very beautiful paintings from China of all orders of insects, executed on rice paper by Chinese artists. A large number of persons interested in Entomology attended the Exhibition.—J. T. C.

WEST LONDON ENTOMOLOGICAL SOCIETY.—The Annual Exhibition of this Society recently took place in the Society's rooms. The following members exhibited drawers or boxes of insects:—Messrs. Goodwin, Longley, Meek, Dow, Gates, Reynolds, Russell, Phipps, Hanson, Silcox, and others. The exhibit of the evening was a very fine series of several hundreds of varieties of *Abraxas grossulariata*, lent by Dr. Harper through Mr. Meek. This was probably the finest lot of varieties ever gathered into one exhibit. Another striking case was of wild plants and flowers, preserved by a new process by Mr. J. English, of Epping. Mr. Boden showed a handsome box of Lepidoptera, and Mr. Meek an interesting and instructive series of British and German Tortrices. The meeting was well attended, and the exhibits generally good.—ID.

THE 'AMERICAN ENTOMOLOGIST' has been incorporated with the 'American Naturalist.'—ED.

ERRATA.—In Dr. White's article on *Orthezia*, Entom. vol. xiii., p. 304, read "1784 and 1785" for "1874 and 1875"; and at p. 305, line 13, for "there is many" read "this is merely."

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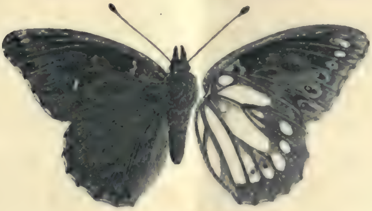
VARIETY OF *ARGYNNIS LATHONIA*.



Argynnis lathonia, *var.*

The beautiful variety, figured above, was taken by me in August, 1876, at the Christiania side of the foot of the Fille Fjeld, in Norway. *A. Lathonia* is widely distributed throughout the South of Norway, and is generally common where it occurs. I have taken it in different years in various localities, but have never before seen any tendency to vary from the normal type. The figure represents the left upper side, and the under side of the right wings.

R. W. Bowyer.

Haileybury, Hertford, December, 1880.

THE MANGOLD-FLY.

By Edward A. Fitch.

(Concluded from p. 13.)

Last June I sent two shrivelled imagos of the mangold feeder to Mr. Meade, who replied, "I cannot determine them with accuracy; they appear, however, to correspond most closely with *Chortophila sulcans* of Schembri and Rondani (see Dipt. Ital.

Prodromus, vi. 211)." In September Mr. Inchbald sent bred specimens to Mr. Meade, who then clearly determined them to be Rondani's *C. sulcans*. In October I received from Mr. Norgate, through Miss Ormerod, more specimens of both sexes, both bred and captured. These were despatched to Mr. Meade, with Curtis's description of *P. betæ*: this reply resulted:—"I am very much obliged to you for sending me the description by Curtis of his *A.* (*P.*) *betæ*. There can be no doubt whatever that it is the same as *C. sulcans*, though he has overlooked one essential character, viz., that the palpi, though black at their tips, are yellow at the base. His description, as also that by Rondani (*sulcans*), only applies to the male. The female generally has the legs of a paler colour than those of the male, and sometimes the femora of the middle and posterior pairs of legs are entirely testaceous like the tibiæ. This female is described by Rondani under the name of *C. effodiens*. There is no doubt now that Curtis's name '*betæ*' must take the place of Rondani's '*sulcans*,' but his description having appeared in an agricultural journal, and not in a purely natural history work, has been overlooked by all systematic writers, though Walker ought to have known it. The *Musca conformis*, Fallen, is a distinct species, of which I have specimens. Fallen's description is so short that it may be applied to several distinct species, but he is decided upon one point, namely, that the antennæ in *A. conformis* have the two first (basal) joints yellow, while in *C. betæ* they are all three black or grey."

It is thus far satisfactorily cleared up that the mangold-fly is Curtis's *betæ*, a most suitable name, and is not Fallen's *conformis*, as commonly given by most continental authors. Dr. Brauer says "*A. conformis*, Fallen, hails from Sweden, and was described by Meigen from examples in Wiedemann's collection. The types are, however, no longer in the Winthem collection, consequently an authentic determination is not now possible. Hence the citation of Nördlinger is preferable." But Curtis's description appeared eight years earlier, and is only reproduced in his 'Farm Insects,' p. 397.

The synonymic difficulty is great, but that does not exactly affect the economic question. That which we call the mangold-fly, by any other name would be as noxious. It is, however, necessary that a correct description should appear, and if any readers of this article possess specimens or living pupæ of the mangold, henbane, or goosefoot leaf-blotchers, I hope they will attempt the solution of this synonymic problem, or transmit the specimens to Mr. R. H. Meade (Bradford, Yorks). The following life-history references should be consulted:—

Curtis. 'Journal R.A.S.E.,' vol. viii., p. 412 (1847). *A. betæ.*

Scholtz. 'Breslau Zeit. für Ent.,' vol. i., Dipt, p. 11 (1849). *A. betæ.*[*]

Nördlinger. 'Die Kleinen Feinde der Landwirthschaft,' p. 556 (1855), *A. conformis.*

Curtis. 'Farm Insects,' p. 396 (1859). *P. betæ.*

Taschenberg. 'Naturgesch. d. Culturpflanzen schädl. wirbellos. Thiere,' pp. 173—5 (1865). *A. conformis.*

Kaltenbach. 'Die Pflanzenfeinde aus d. k. d. Insekten,' pp. 456, 510, 512 (1872—4). *A. betæ.*

Farsky. 'Verh. z-b. Gesell. Wien.' vol. xxix., p. 107 (1880). *A. conformis.*

Taschenberg. 'Praktische Insekten-Kunde,' vol. iv., p. 123 (1880). *A. conformis.*

Holmgren. 'Entomologisk Tidskrift,' vol. i., p. 89 (1880). *Aricia betæ.*

Réaumur. 'Mém. pour servir à l'histoire des Insectes,' vol. iii., pp. 13—19, pl. ii., fig. 13—17 (1737). Feuille mineur de jusquiame.

Goureau. 'Ann Soc. Ent. France,' 2nd ser., vol. ix., pp. 163—6, pl. vii., 16 (1851). *P. atriplicis.*

Desvoidy. 'Guérin's Rev. et Mag. de Zoologie,' 2nd ser., vol. iii., p. 230 (1851). *P. atriplicis.*

There are several further difficulties—Nördlinger's, Taschenberg's and Farsky's descriptions do not exactly quadrate. Does more than one species blotch the mangold leaves in the larval state? Are the henbane, *Atriplex*, and *Chenopodium* feeders synonymous with our mangold species? Goureau says, "Le Pégomyie de l'Arroche (*P. atriplicis*) se jette aussi sur les Betteraves que l'on cultive dans les jardins, et en dévoire des feuilles." Robineau-Desvoidy gives similar information, but adds, "C'est à tort que dans la collection de M. Goureau cette espèce (*P. atriplicis*) est etiquetée *P. hycregami* (*sic*), qui constitue une espèce différente." Haliday gives *P. atriplicis* as a synonym of *P. betæ* in his papers on the "Metamorphoses of Diptera" (Nat. Hist. Rev. iv. 187). Rondani gives *A. atriplicis* as a synonym of his *P. chenopodii* (Bull. Soc. Ent. Ital. x. 161). Schiner says, "Goureau's *A. atriplicis* is probably *A. hyoscyami*" (Dipt. Austriaca, i. 652). Zetterstedt is perhaps the best authority on the *Anthomyiidæ*, but *A. hyoscyami* is amongst his "species omissæ;" and his countryman, Holmgren, has just described the mangold-feeder as a new species, placing it in Zetterstedt's genus *Aricia*.

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[*] "*Anthomyia betæ*, mihi (allied to *A. exilis*, Meig., *A. versicolor*, Meig., and *A. mitis*, Fabr.), mines the leaves of *Beta trigyna*, certainly in companies, according to my own observation, making large blotches which sometimes cover the whole leaf." The descriptive part of Dr. Scholtz's papers was not completed, so the description of *A. betæ* never appeared.

This year's attack of *C. betæ* is unfortunate, as it may be calculated to limit the culture of this useful root-crop, which is now so generally extending in the North. However, it is a repeatedly observed fact that these extraordinary appearances are not continued in succeeding seasons; so we may hope it may be with the mangold-fly. This pest destroys the functions of the leaves, frequently called the plant's lungs, and thus causes a species of consumption; it rarely proves fatal, but it affects the growth and health of the plant considerably.

Until we know more of the special habits of this pest no practicable remedy can be given, except the self-evident one to destroy when found,—whether it be the larva in the leaf-blotches, the pupa in the ground, or the fly itself, if you happen to know it.

Maldon, Essex, December 6, 1880.

[Points of specific distinction between *Chortophila betæ*, Curtis, and some nearly-allied species, which all have red or yellow palpi with black ends, and partly rufous or yellow legs.

Genus CHORTOPHILA, *Macquart*.
PEGOMYIA, *R. Desvoidy* (prt).

Eyes bare; contiguous or subcontiguous in the males; styl of antennæ naked, or slightly pubescent; alulets small, wit the scales equal in length; abdomen narrow, subcylindrical o flattened; sixth longitudinal or anal vein of wings continued t the posterior margin of the wing.

ANALYSIS OF SPECIES.

A. Antennæ entirely black or grey.

Sp. 1. BETÆ, *Curtis*.

A.A. Antennæ with the two first joints red.

a. Frontal space black.

Sp. 2. HYOSCYAMI, *Panzer*.

b. Frontal space red or yellow.

* Abdomen partially or wholly testaceous.

Sp. 3. CHENOPODII, *Rondani*.

** Abdomen entirely grey.

Sp. 4. CONFORMIS, *Fallen*.

Sp. 1. *C. betæ*, Curt., *sulcans*, Rond., *atriplicis?*, Goureau, *effodiens* (female), Rond.—Long. 2½ lin. Eyes subcontiguous in male, separated by a space equal to one-third of the width of the head in female; forehead slightly prominent; frontal space rufous at fore part in male, totally yellow in female, with a white border; palpi yellow with black tips; body yellowish grey in male, and ashy grey in female; thorax with three indistinct brown dorsal stripes; abdomen with three or four longitudinal spots on the back, forming an interrupted dorsal band, nearly obsolete in the female; legs black in the male, with the exception of the four tibiæ, which are tawny; legs of female with femora and tibiæ wholly testaceous, or with the femora partly cinereous, and sometimes striped along their upper surfaces with brown; tarsi black; wings with the external transverse vein slightly oblique.

Sp. 2. *C. hyoscyami*, Panz. — Long. 2—2½ lin. Head similar to that of *C. betæ*, except that frontal space is black, and basal joints of antennæ are red; palpi yellow with black tips; thorax ash-grey with five indistinct stripes; abdomen marked as in *C. betæ*, sometimes entirely cinereous, but frequently with a testaceous tinge, particularly towards the apex, which shows through the grey pubescence; legs testaceous with black tarsi, and more or less grey at the bases of the anterior femora; external transverse veins of wings upright.

Sp. 3. *C. chenopodii*, Rond.—Long. 2—2½ lin. This species, of which I only know the female, is similar to *C. hyoscyami* in all points, with the exception of having the frontal space yellow and the abdomen always testaceous. I believe it is only a variety of the same.

Sp. 4. *C. conformis*, Fall.—Long. 3 lin. Only the female of this fly is known. The forehead is decidedly prominent; the frontal space, the cheeks, the two basal joints of the antennæ and base of the palpi all bright yellow; tips of palpi black; thorax and abdomen both ash-grey and immaculate; legs (with the exception of the black tarsi) wholly of a bright reddish yellow colour.—R. H. MEADE.]

LIFE-HISTORIES OF SAWFLIES.

Translated from the Dutch of the late DR. S. C. SNELLEN VAN VOLLENHOVEN.

BY J. W. MAY.

(Continued from vol. xii., p. 264.)

TENTHREDO COLON, *Kl.*

Imago: F. Klug, "Die Blattwespen, nach u. s. w.," in 'Der Gesellsch. Naturforsch. Freunde zu Berlin Magazin,' vol. viii., p. 182, No. 121. Hartig, 'Blatt- und Holzwespen,' p. 312, No. 56.

Larva: Kaltenbach, 'Die Pflanzenfeinde, aus d. Kl. d. Ins.,' p. 251, No. 5.

Tenthredo nigra, ore maculaque duplici ad basin coxarum posticarum albis, abdomine praeter basin et pedum maxima parte rufis, alarum squamis ochraceis, stigmate fusco, antennis albo annulatis.

On the evening of the 16th of September, 1872, in my garden at Leyden, I observed a caterpillar which was entirely unknown to me, feeding on a fuchsia plant. Considering the very few insects to be found on introduced, half-naturalised plants, I was specially interested in the discovery, and not less so when, on closer observation, I found the supposed caterpillar was a sawfly larva. The following morning I searched over several fuchsia plants, but failed to find any more larvæ of the same species; but on the evening of the same day, in the twilight, I found one more, from which it appeared to me that, as is the case with other sawfly larvæ and some species of Noctuæ, they conceal themselves during the daytime, and perhaps even go below the surface of the ground, only making their appearance when the shades of evening have commenced.

The larva I had found (fig. 1) appeared to be not full grown. The head was shining, and of an orange tint, shaped like a Leyden cheese, and covered with extremely fine hairs; on either side was a deep black circular spot, having the eye in the centre, and on the posterior part of the vertex—one might almost say on the neck—a small black triangle. From this triangle proceeded two somewhat curved black lines on the first segment, ending behind an almost round black spot on either side. The upper surface of the body, as far as the penultimate segment, appeared to be of a purple colour, and the under surface sordid yellow; in reality, however, the colour of both sides was the same, but the upper surface was covered with purplish brown markings consisting of curved lines, originating from two fine lines running next to each other along the back. The appearance of these curved lines is easier to figure than to describe (see fig. 2). The segments were further divided into many folds (see fig. 3), the greater number of which were covered with rows of little white spines. At the sides, where the skin was pale in colour, were dark oblique transverse lines above all the legs, with the exception of the first pair. The larva had six horny articulated legs, seven pairs of abdominal legs in the middle of the body, and two anal legs. The last two segments were without any markings.

Some days afterwards, I found one of my larvæ in the act of casting its skin. This proceeding was conducted in a singular manner, which, however, I had once before observed in a sawfly larva, namely, by placing itself round a stalk, and holding on by four or six of the middle legs; and I afterwards observed that the shed skin of the larva remained attached to the stalk in that position. The newly-moulted larva was shining greenish yellow, of a more yellow tint than before, and with only faint traces of the markings. A couple of days later the larva assumed the appearance of fig. 4 (see also fig. 5). It was then twenty-three millimetres long; the markings had remained the same as on the preceding skin, with the exception that on the penultimate segment was a three-pointed spot, which, however, might have been merely the appearance through the skin of matter in the intestinal canal about to be ejected; the ground colour was, however, paler. Shortly after this the larva moulted for the last time, changing entirely both as to colour and markings; it also appeared to have decreased in size. The colour was a darker brownish yellow (figs. 6 and 7). In the place of the former little triangle on the vertex of the head were now to be seen two fine black lines of equal width; the markings on the back were distinctly brown, more sharply defined, and less curved than before; they also extended further, and there was now a black line on the last segment (fig. 7).

The larvæ, for the other had shortly afterwards undergone the same moulting, now ceased eating, and crept into the ground, or rather into the mould which I had placed in their glass, where they made a double cocoon, one of which is represented at fig. 8. I failed, however, to obtain anything from these cocoons, so that my trouble in the matter was thrown away.

On the 21st of the following September, 1873, I found a considerable number of the larvæ of this species on *Circæa lutetiana* in the wood at the Hague, where the plant in question is very common. I could observe no difference between these and the larvæ taken on the fuchsia. I endeavoured to rear a good number, but to my astonishment, in the following spring, with the same result; not a single imago made its appearance. In the mean time I had discovered, from the above-mentioned work of Kaltenbach, that my larvæ were the second state of *Tenthredo Colon*, Klug. I consequently determined to search the plants of *Circæa lutetiana* in the wood in May and June to see if I could find the imago. It was not, however, until the 24th of July, when I had almost thought of giving it up, that I saw a pair of sawflies flying about the plant; this was about one o'clock in the afternoon, and the day was sunny; they seemed to be chasing each other. I captured them, and recognised *T. Colon*. I saw some more the same day, but I was not able to take any of them. On the following day, the sun only coming out now and then, I saw in these intervals of sunshine several imagos evidently about to pair. I captured several pairs, and on taking them home I found they were all the same species. On the following day, however, which was rainy, I could find no more; the weather continued to be wet for some time after, and I never met with the species again.

Compared with the number of larvæ to be found in the wood in the autumn, the number of imagos on the wing was certainly small; of course this disproportion is, in the first place, to be ascribed to the usual causes limiting, in the case of all animals, the number of individuals arriving at maturity, but also, in the second place, to the long continuance of cold in the spring of 1874, which destroyed so many insects. The question now arises whether I am right in correlating the imagos I had captured with the larvæ I had observed: without doubt to accept such a conclusion would in many cases be taking too much for granted; but when we consider that *Circæa lutetiana* is a very local plant, and that it is used as food by but few insects,—that among these only a single sawfly larva is known, which is the species now under consideration, *T. Colon*,—moreover that my insects completely agree with the description given by Kaltenbach, who succeeded in rearing this species,—I think it will generally be conceded that I am justified in assuming the specific identity of my larvæ with the imagos I captured. Of course from what I have stated above it follows that I had no opportunity of observing the pupa; this is, however, the less to be regretted, seeing that in general the pupæ of sawflies offer no points of interest.

The male imago (figs. 9 and 10) is eleven millimetres long, and expands to twenty-one millimetres. The body is cylindrical and almost equally broad throughout, with the exception of the shoulders, which are somewhat wider, and the head, the breadth of which is caused by the projecting eyes, between which the forehead is deeply indented; the posterior margin of the head is angularly truncated, and even appears to be narrowly bordered.

The head is entirely black, with the exception of the clypeus and the trophi. The clypeus is very deep, roundly emarginate, the upper lip is circular and very projecting; the mandibles are brown at the tip, shading off into black; the 3rd and 5th joints of the maxillary palpi and the last joint of the labial palpi are black at the tip. The ocelli are black and small, and are placed somewhat on an elevation; the basis of the antennæ also projects from the cavity of the face. The antennæ are black, and are nine-jointed; the 2nd joint is inserted obliquely on the 1st; the three penultimate joints are white, the 6th being black at the base.

The thorax, rendered dull by the puncturation, is black, with fine grey pubescence; the tegulæ are pale brown, and the cenchri white. Between the bases of the intermediate and hinder coxæ on either side is a shining, round, white spot.

The abdomen is very shining, and somewhat flattened from above, being even indented in the middle at the apex. The 1st segment is black, and has a longitudinal slit in the middle of the dorsum, and on either side a rounded, triangular white spot, covered with white hairs; the 2nd is black, the 3rd brown-yellow, with black base; the suture between this and the 4th is black; the remaining segments are brown-yellow, gradually passing over to red-brown; the ventral surface is paler, being even yellow on the 2nd segment.

The wings are tinged with brown, iridescent, narrow as compared with their length; the costal nervure is red-yellow, the nervures enclosing the anterior portion of the anal cell (the so-called lancet-shaped cell) and the transverse nervure in the cell in question are yellow; all the other nervures are black. The stigma is also black, which is one of the chief points of difference between this species and *Tenthredo livida*, L., in which the stigma is pale brown or yellow.

The four anterior legs are long and slender, the two posterior being somewhat more robust. The anterior legs are yellow or yellowish white, with a black line on the hinder side of the coxæ, apophyses, and femora; the intermediate pair are somewhat redder in tint, with similar black markings. The coxæ of the hinder pair are black, spotted with white, as are also the apophyses; the femora are brown-red, with a broad longitudinal line on the inner side; the tibiæ are red with black apices, and are armed with long red terminal spines. The tarsi have the first joint black, the extreme base being red, the three following black, the apical joint being red-brown; the colour of the tarsi, however, differs in individual examples. (For the above description see figs. 9 and 10). The female is but little larger than the male, and differs principally on the following points: the abdomen is a little broader, and the femora are somewhat thicker; of the former the first four segments are black, having the usual white spots a little larger; the 5th, 6th, and 7th segments are brown-red, the 8th and 9th castaneous or black. The sheaths of the saw are black.

The coxæ are entirely black, but the apophyses have white margins, and sometimes a white spot on the under side. The black line along the posterior femora spreads out much broader towards the knee, where it almost encircles the entire femur. The posterior tarsi appear to me to be narrower.

According to the new catalogue of Hymenoptera the present species must be rather common in the Netherlands; at all events it has been taken in various localities. I am, however, not quite sure that these statements are perfectly correct, as I find mentioned three examples having one-half of the stigma white, which thus clearly do *not* belong to this species, but probably to *T. livida.* The distinction between the two very nearly-allied species does not always appear to me equally clear. According to Klug, Hartig, Kaltenbach, and Kirchner, *T. Colon* occurs in Germany. According to Thomson it is scarce in Sweden. I do not know whether it is found in England, but it appears not to occur in Scotland. I cannot find any notice of its occurrence or non-occurrence in any of the other countries of Europe.

NOTES ON THE LEPIDOPTERA OF NATAL.

By William D. Gooch, C.E.

(Continued from p. 7.)

NYMPHALIDÆ (*continued*).

In a previous part of this paper I spoke of the genus *Neptis*, with one representative of which my name is associated. It is essentially a woodland genus, and found chiefly on the coast in bush-lands. The two, *Saclava* and *Goochii*, are very delicate-winged insects, almost rivalling *Pontia Alcesta* in this respect, they are so fragile; the more apparently so, that they are fond of loitering about spots where Spanish needles grow, a weed with long, sharp hook-pointed seed-cases which detach themselves easily; when striking for the insect a number of these "needles," also known as "black Jacks," get into the net and ruin the wings. The only larva of this class which I believe to have fallen to my lot was a very singular one with many spines, those on the 4th and 5th segments being very *dendritic* in character, and branching backwards. The imago on disclosure was so badly developed that I could only proximately identify it as *N. Saclava.*

A very abundant coast insect, which, properly speaking, is closely allied to *Charaxes*, is *Philognoma Varanes* approximating *N. Candiope* in colour, except for the green veining of the latter, and having the basal parts of the wings of a bright soft white, which makes a conspicuous patch and mark as the butterfly darts rapidly through the sunlight, and which is as suddenly extinguished when it settles on the under side of an orange or other large leaf of a similar character. The under side of the wings, when closed and the insect settled, is so protective that I have often seen one alight immediately before my eyes, and although I had seen it and was looking at it, it was only by close inspection, or perhaps by a quick flutter of the wings as the insect moved, that I could really identify it. The under side has a continuous line transversely of the wings, which imitates the midrib of the leaves, and makes the deception stronger. The transformations have been worked out at King William's Town by Colonel Bowker and Mrs. Barber, I believe, but I have never been successful in obtaining larvæ.

Euryphene cærulea, a Nymphalid, is reputedly Natalian; it is a very handsome butterfly, deep blue above, and red-brown under wings. I have never seen it. It is not improbably a bush insect, and inconspicuous.

Two butterflies, *Crenis Natalensis* and its congener *Crenis Boisduvali*,—which every now and then, depending on the seasons, are most conspicuous by their abundance,—are interesting because the larger variety, *C. Boisduvali*, which is distinctly different, having a different larva, is marked exactly like one form—not, I think, a sexual one—of the other, *Crenis Natalensis*. From my breeding, it was a question whether the larvæ produced both insects from the same brood, although of different characters themselves, or whether the insects bred indifferently the two forms of larvæ. My experiences, as far as I could sum them up, rather indicated a double form both of imago and larva. Certainly both forms of larvæ produced the ochreous-spotted imago. But the ochreous-spotted imago seemed to be a variety (not sexual) in one case, and a constant form in the other. Mr. Spiller would not have any difficulty in settling the question, as the larvæ of both varieties are abundant periodically. The larvæ in one case are spined with divergent stellate spines, and light coloured; in the other shiny, with short simple spines, blue-black on a brown ground. The pupæ are almost identical, fleshy green, with no markings.

The handsome but not conspicuous genus, *Harma*, belongs to the Nymphalid family. The two varieties known are both hill-top frequenters, as far as my experience teaches me.

Meneris Tulbaghia, a magnificent insect, is practically unknown to me; it is a large up-country butterfly, and the only specimens I have are gifts. It is a well-known Cape insect; indeed is named after an old Dutch governor, Tulbagh. It is closely allied to our English Graylings, but much bigger and brighter, and with large ocelli. The list of South African Nymphalids would be quite incomplete without this butterfly, which occurs freely in the wooded kloofs of Natal.

EURYTELIDÆ.

The *Eurytelidæ* are represented by a very common and a rare insect on the coast-lands, precisely similar, not in the colour, but in the form of the markings, the former, *E. Hiarbas*, being black, with a white stripe; and the latter, *E. Dryope*, deep red-brown, with a yellowish brown stripe. These are so very similar that I am quite prepared to believe them to be abnormal varieties. The habits on the wing and their haunts are similar. The larva and pupa of *E. Hiarbas* are well known to me, being quite common, and feeding on a creeper with something like a Petunia flower. They are both conspicuous by their forms. The larva has two long divergent clubbed and rough horns on its head, and the pupa is remarkable by its angulated, excavated, and alated development. I did not establish sexual difference of markings in the larvæ, although some were green with black marks and others were green all over. As this smoky or black suffusion is not an uncommon feature of a sexual variation in larvæ, I accept it from that point of view.

ERYCINIDÆ.

The *Erycinidæ* are only represented by a very errant type, viz., *Libythæa Labdaca*. This insect was first discovered by Mr. Morant, but appears to be very local, or very irregular in appearance. Five years of collecting never yielded me a specimen, when lo! just as I am leaving Natal, it occurs fairly abundantly, and is taken by several collectors synchronously. As it is an insect that could not be mistaken for anything else on the wing, I fancy it is periodical, which may account for its hitherto rarity in collections. It has long prominent palpi, forming a beak in front of its head; it is otherwise not noticeably marked.

SATYRIDÆ.

The *Satyridæ* have always been associated in my mind with the tradition of a gigantic butterfly that was seen by the former Curator of the Botanic Gardens, Natal, Mr. D. M'Ken, and which, from his description, fitted more closely to the characters of this family than any others. As Mr. M'Ken did not catch the insect it still remains a myth, and is to be looked for in the precipitous ravines of the Inanda Hills, behind Verulam. The species known to me are most conspicuously the "crepuscular" pair, *Cyllo Leda* and *Gnophodes Parmeno*. They used to visit my sugar regularly after sunset and in the moonlight. I have bred *Cyllo Leda*, and found the larvæ correspond fairly with the Indian species of Horsfield and Moore. I am not sure whether I have seen the larvæ of *Parmeno*. I took some that differed very slightly from those of *Leda*, fed on the same food-plant, a broad plaited-leaved grass of woodland habit, and altogether prognosticated *G. Parmeno*, but they were all ichneumoned, and I did not rear a single specimen, and never found another batch of similar ones. The two insects are so closely congeners that one would imagine the larval differences to be very slight. They are absolutely given to "very shady proceedings," as I never saw them during daylight free on the wing, unless put up when scrambling through dark shaded thickets, on which occasions they settled again almost immediately on the ground amongst dead leaves, &c., which the under side of the wings, especially of *G. Parmeno*, closely mimics; *C. Leda* less so, but still quite enough to make the insect next to invisible when at rest. Both seem to enjoy the hour after sunset; I have seen ten or twelve dipping about, with the peculiar plunge they make in flight, round and round a little patch of their favourite food-plant, the grass above mentioned, in an open glade under trees. My sugar always attracted them freely, even up till 10 or 11 p.m.; on clear nights I have found *C. Leda* especially, sipping the sweets I had purveyed for other guests. The under side of *G. Parmeno* is one of the most lovely studies of greens, greys, and browns in rich and delicate tracery that I am aware of in the insect world; this butterfly does not vary at all in my experience.

Cyllo Leda, on the other hand, is so variable in the size, development, and colour of its ocellic spots on both sides of the wings, that it is difficult to get two specimens exactly the same.

It has been suggested by Mr. Trimen that *G. Parmeno* may be a derived form from *C. Leda*, and the idea commends itself to any one who has examined, closely, a series of the two species from Natal.

Debis Dendrophilus, a very handsome insect, is rare on the coast, and is found in the higher wooded ravines of the country inland. I am consequently not very well acquainted with it; indeed, the great development of this family, *Satyridæ*, is better seen in the grass-lands. My particular neighbour was *Hypanis Ilithyia*, which was interesting because of the very singular variety presented by the under side of the wings. A sort of chocolate suffusion, with the dark festoons reversed and shining, whitish instead of dark upon the ground, is the chief characteristic, but at first sight it presented a very dissimilar aspect, the amount of "suffusion," if I can use the expression, was very variable, and the differentiation of the under sides similarly altered.

LYCÆNIDÆ.

The Blues and Coppers are very largely represented, the former especially, in the brilliant *Aphnæus* and *Loxura;* they form a very grateful addition to the cabinet. I am unacquainted with many of their transformations, a *Loxura*, bred by Dr. Seaman, of Pinetown, and a small *Lycæna Amarah* by myself, being the sum total.

The Coppers were not freely represented in my neighbourhood; they are more numerous in the open country, with scattered mimosa bush, which makes the Cape and up-country districts peculiar. There are in South Africa many very interesting and varied forms uniting the peculiarities of both these groups. *Myrina Pallene*, too, with its sulphury-white wings, does not do credit to its blue blood by its colour, but it is undoubtedly "pur sang" when examined critically.

The eccentric little butterfly, *Pentila Tropicalis*, belongs to the *Lycænidæ*, although at first sight you would not give him credit for doing so. It is very common in two or three woods in the coast woodlands, and is noticeable on account of its funny colour and wings, with spots and tips of a deep neutral purple in some lights, and black in others (this colour soon fades into the latter after first freshness of emergence). It is gregarious, slow in flight, haunting shady spots, and is very like a day-flying spotted Geometer, which no doubt mimics it. I have had no experience of its transformations.

Lycæna Bœtica and *L. Lysimon* occur in Natal, *Bœtica* in abundance.

I am afraid that this notice renders scant justice to the really large group of insects which are included in the *Lycænidæ*, but they vary in such small particulars that it is difficult to deal with, except when the cabinet lies open before one.

HESPERIDÆ.

The last family, the *Hesperidæ*, is, although last, not least; it is well demonstrated, and includes some very handsome and special insects. The genera *Leucochitonea* and *Caprona* are both handsome and rare. *L. Paradisea* and *L. bicolor* are very local, strongly-coloured insects, and are probably crepuscular. I have noticed that the *Hesperidæ* are mostly of crepuscular habit. I took two rare insects, viz., *Proteides Fiara* and *Pamphila Dysmephila*, male and female, in the evening, on the wing amongst *Sphingidæ*, feeding, and in each case thought I had either *Lophura Nana* or some small hawk in my net, only finding out my "pot" when I got to the light. All the species—*Ismene Keithloa*, *I. Ratek*, and *I. Valmaran*—are equally fond of sunset, and, although they may be seen during the day, they seem much more alive later. *Caprona Canopus* is a somewhat rare and also conspicuous insect; it is pearly white, with darker cloudings and edgings of brown. It always settles on the under sides of the leaves with its wings open, which is a feature of many of these butterflies. *Nisoniades Ophion* also does the same; it is an insect of allied habits, and has a trick of flying to the light, like a moth at night; I have taken it in that way several times.

Pyrgus is represented pretty freely. *P. vindex*, with its little black and sulphur checkers, is one of the most common of the Natal butterflies. I assisted at the transformations of *Ismene Valmaran* and *I. Ratek*; also of *Pyrgus vindex*. The former have very similar brightly-coloured larvæ, feeding on indigo and a yellow-flowered *Papilionaceous* tree. They struck me as mimicing *D. Chrysippus* in colour and markings, the tentacles wanting. *Pyrgus vindex* rejoices in a powdery-white little caterpillar with a big black head; it feeds on a *Lamium*, on the white under side of whose leaf it is difficult to perceive it.

REMARKS ON OUR DIPTEROUS PLANT-MINERS, AND THE PLANTS THEY AFFECT.

By Peter Inchbald, F.L.S.

Before I mention the families of plants, and the mining-larvæ that affect them, it may perhaps be well to say a few words on the habits of life, so far as I have noticed them in my own neighbourhood, of this somewhat neglected group of Diptera. The tunnel, which tells us often of a whole summer's life, may be readily seen on the surface of the leaf. As the larva grows and feeds the tunnel becomes larger and wider; thus the miner adapting itself to its requirements. Sometimes the pulp is consumed by the feeder, and an unsightly blotch is all that is left to evidence its depredations. Sometimes beautiful scroll-work tells of the artistic labours of the little miner. This is especially the case in the primrose-miner, whose tracings may be readily seen on the primrose plants that cover the sloping banks of our green lanes. The pulp, or parenchyma, is detached by a singular instrument, which is readily seen by holding the mined leaf to the light; a black pickaxe-like process is protruded from the mouth. This sways to and fro, often with wonderful rapidity, as it gathers its supply of food. When it is about to assume the pupa-state the larva mostly leaves its tunnel, and seeks either to bury itself in the soil or to attach itself to the decaying leaves that have served it as food and homestead. In some instances I have found the pupa-case attached to the under side of the leaf; this is especially the case in the miners of the primrose and hogweed. These little mining-flies are not so difficult to hatch, if the collector will only imitate Nature in her ways and means. The affected leaves should be put into a large-sized glass-topped box, wherein the larva may continue to feed a little longer. When full-fed it creeps forth, and pupates either among the leaves or at the bottom of the box. I have found a slight sprinkling of water occasionally needed to supply Nature's provision of rain and dew, and this should be continued during all the period of pupational inertness. From my last season's larvæ I am looking for quite a bevy of imagines in April and May.

Ranunculaceæ.—In this family I found during the present year two miners,—one in the leaves of *Ranunculus repens*, the other in those of *Aquilegia vulgaris*. The pupæ from the columbine are of a shining amber, those from the crow-foot of a dark brown.

UMBELLIFERÆ.—I have met with two miners in the leaves of our Umbelliferæ. One tunnels *Angelica sylvestris;* the other, which is far more common, *Heracleum sphondylium*. Several of the latter larvæ have pupated and given forth their tenants, the *Phytomyza albiceps* of Meigen.

CAPRIFOLIACEÆ.—The miner of the honeysuckle, *Lonicera periclymenum*, appears on the wing in spring. It pupates within the mine, and puts on wings during the first sunny days of April. I hatched several last year. It may prove identical with the *Phytomyza aprilina* of Goureau.

COMPOSITÆ.—No fewer than eight of our Composites give evidence of mining Diptera,—*Sonchus*, *Lactuca muralis*, *Lapsana*, *Taraxacum*, *Bellis*, *Tussilago*, *Arctium*, and *Senecio vulgaris*. I have a good supply of pupæ from them all. Those of *Tussilago* and *Senecio* are pale yellow, the others are blackish brown.

LABIATÆ.—The leaves of *Stachys sylvatica* were blotched in September, the larvæ pupating in October. The pupa is dark amber.

PRIMULACEÆ.—The common primrose offers a beautiful mine. The larva, when full-fed, creeps forth and pupates most frequently near the mid-rib or at the foot of the lateral rib; the case is hid among the down on the under side of the leaf. I have above fifty pupæ of this fly. It is somewhat difficult to detect the pupa in its downy covering. I hatched this species in 1873, and it was then supposed to be identical with the *Phytomyza primulæ* of Macquart.

CHENOPODIACEÆ.—I noticed that the leaves of the mangold, *Beta cicla*, were blotched and blistered in the summer by a most voracious larva; whole fields looked as if they had been scorched. I bred the fly, and it proved to be, according to Dr. Meade, the *Anthomyia sulcans* of Rondani, the true *Anthomyia Betæ* of Curtis, who has the prior claim, I am told, as regards the nomenclature.*

POLYGONACEÆ.—*Rumex acetosa* was blistered and blotched by a miner, that proves to be the *Chortophila transversalis* of Zetterstedt. This larva is most ravenous, like that of the mangold, even driving its furrow through the mid-rib, and blistering the leaf from end to end.

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* For an exhaustive article upon the dipterous leaf-miner of the mangold, see Mr. Fitch's papers in this and last numbers of Entom. pp. 8 and 25.—ED.

The Lodge, Hovingham, York, Dec. 22, 1880.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

LYCÆNA ACIS NEAR ADDISCOMBE.—Upon looking over a long series of Blues taken at Croham Hurst during last August, I noticed one which I thought looked very like *L. Acis*. I therefore took it to the British Museum, and Mr. Kirby kindly identified it for me as that species.—A. SIDNEY OLLIFF; 36, Mornington Rd., Regent's Park, N.W.

DESCRIPTION OF A EUPITHECIA NEW TO THE BRITISH LIST.—Wings in shape, colour, and size very much like those of *Eupithecia lariciata*, with about ten strigæ of dark grey, broader and darker at the outer half of the wing; the basal portion being lighter and much the same shade as the under wings. There is a small white spot near the anal angle of the under wing, a small round black spot near the centre of each wing. A notable character is a dorsal chain of nearly white spots on upper ridge of the abdomen; ciliæ dark. The parent moth was taken in the Isle of Man during July, 1879. The eggs were laid by it during the same month, and the larvæ were reared during that summer by the late Mr. Noah Greening, who fed them on dandelion-flowers. The one above described emerged from the pupa in July, 1880, along with others of the same brood, but this one alone came out perfect. In case this should be a species new to Science, I have named it provisionally *Eupithecia Blancheata*, in compliment to Miss Greening, who captured the parent moth.—N. COOKE; Gorsey Hey, Liscard, Birkenhead, January 6, 1881.

ABRAXAS GROSSULARIATA.—I have several times found the ordinary spring brood of larvæ of *Abraxas grossulariata* feeding on *Sedum Telephium* and *S. latifolium* in my garden, where of course there were both currant and gooseberry trees.—H. HARPUR CREWE; Drayton-Beauchamp Rectory, Tring, January 6, 1881.

MICROPTERYX FASTUOSELLA.—I have met with this insect this season. Whether it is a species or only a form of *M. subpur-*

purella, I cannot say. However, I hope some day to clear up the question.—J. B. HODGKINSON; 15, Spring Bank, Preston, December 6, 1880.

LEPIDOPTERA REARED IN 1880.—I forward you a list of some of the Lepidoptera which I have reared out of doors during the past season, with the dates of appearance. These dates, I think, will compare favourably with last year, most of the species being considerably earlier:—April 7th and 20th, bred *Heusimene fimbriana;* middle to end of month a number of *Tephrosia consonaria*, *T. crepuscularia*, and two *Amphydasis prodromaria;* May 1st, *Notodonta trepida* and *N. dromedarius;* May 1st to 12th, a splendid series of *Elachista poella;* 12th, *Cucullia verbasci*, *Nola cristulalis*, and *Notodonta chaonia* (having taken no larvæ of the latter for three years, I was surprised to see a very fine male in my cage, which must have remained in pupa during that period); May 14th and 15th, bred *Nola cristulalis*, *Notodonta dodonæa*, *N. trepida*, two *Stauropus fagi*, *Abrostola triplasia*, and *Ephippiphora nigricostana;* 16th to 20th, *Notodonta dromedarius*, *Nola cristulalis*, *Selenia lunaria*, *Platypteryx falcula*, *P. lacertula*, and several *Ephippiphora nigricostana;* 21st to 25th, several *Cymatophora fluctuosa*, *Macaria notata*, *Notodonta dodonæa*, and *Stauropus fagi;* June 2nd, two *Cucullia lychnitis*. From early in June to the middle of July I reared a magnificent lot of *Axylia putris*, from larvæ found last autumn feeding on nettle and hop on Hackney Marshes. *Apamea unanimis* was scarce this season; I succeeded in finding only nine pupæ. The moths emerged end of May and beginning of June, fully a month earlier than last year.—WILLIAM MACHIN; 22, Argyle Road, Carlton Square, E., December, 1880.

THE BLUE BEETLE (PHÆDON BETULÆ, *Linn.*)—During the last two or three years some parts of this district, *i. e.*, the Isle of Ely, have again suffered from the ravages of a coleopteron (*Phædon betulæ*, Linn.), provincially designated the "blue beetle," which is apparently destructive during both larval and imago states of its existence, and which has attacked, and in some instances destroyed, entire fields of mustard, cress, cabbages, &c. I first noticed the reappearance of this beetle three years ago on a field of white mustard, which it attacked about the time of the formation of the seed-pod, and from the stalks of which it stripped almost all the cuticle. On the crop of mustard being reaped the beetles transferred themselves to a small breadth of *Kohl Rabi*, of which they entirely consumed, at first the leaves and then the bulb, leaving nothing but the bare stalks. As far as I have observed, the food of this species seems to be confined to plants of the mustard tribe. The perfect insect apparently hybernates, reappearing in the spring on cruciferous plants, which it does not then injure to any extent, and lays its eggs. The egg, elongated, oval, and of a dark orange colour, is laid on the under side of the leaf. The larva feeds at first on the leaves, and when these are exhausted attacks the cuticle of the stem after the habit of the perfect insect, which appears in August, and at once begins to feed on everything cruciferous. On the approach of winter the beetles go in hybernacula, in the soil, or more frequently in the old stems of the stubble of the crop where they have been bred. The regular appearance of this pest of late years has seriously affected the production of these crops, and indeed in some districts entirely precluded their being grown.—HERBERT FORTESCUE FRYER; Chatteris.

POGONOCHERUS HISPIDUS AT FINCHLEY.—On looking over some moss, &c., obtained from the Finchley Road on Monday, January 3rd, I was very pleased to find a specimen of the above insect. Last April (1880) I managed to get two specimens from the same locality. Amongst other species, I found *Pterostichus melanarius*, *Stilicus affinis*, *Tachyporus chrysomelinus*, and *Cercyon terminatum*, all of which were very common.—A. SIDNEY OLLIFF; 36, Mornington Road, Regent's Park, N.W., January 7, 1881.

ACOSMETIA CALIGINOSA: SUPPOSED LARVÆ.—At the Haggerston Society's Exhibition last November, I exhibited what I then believed to be larvæ of *A. caliginosa* which I had reared from eggs. This is recorded in the 'Entomologist' at page 25, vol. xiv. I have since found that they are the larvæ of *Rusina tenebrosa*. I regret this error should have occurred.—J. W. JOBSON; Bournemouth, January 14, 1881.

[It is impossible to be too careful in identifying ova. Many mistakes occur through eggs being found in a box with a female moth. Some collectors at once jump to the conclusion that they are those of the insect in the box, and so go to the trouble of rearing common species in mistake for a rarer one.—ED.]

The Rhopalocera of Europe.—We understand that it is intended shortly to issue, in monthly parts, a really good work on this subject. Every species is to be figured in colours, showing the under sides, as well as the varieties when of importance. Probably this work will remove one of the chief difficulties which have stood in the way of English students of European butterflies, for the price will be within the reach of all. The work has been undertaken by Dr. Henry C. Lang, of London, whose knowledge of the subject will be a sufficient guarantee for the accuracy of the descriptions, and notes which are to be given of habits, localities, &c., not only of the imagines, but also of the larvæ. We further understand that there will be occasionally plates of larvæ and pupæ. We sincerely wish that this work may stimulate greater attention to this, the most beautiful, section of European Lepidoptera, by no means so difficult to obtain as many collectors seem to think. Prospectuses may be had on application to West, Newman & Co., 54, Hatton Garden, London.—Ed.

OBITUARY.

Etienne Mulsant.—This veteran French Coleopterist died at Lyons on the 14th November last, at the ripe age of eighty-three, he having been born on March 2nd, 1797, at Mornant, Rhône. For many years M. Mulsant was librarian of the Public Library at Lyons, which contains about 150,000 volumes and many valuable MSS.; also librarian to the important "Société d'Agriculture, histoire naturelle et arts utiles de Lyon," to whose "Annales" he contributed many valuable communications. These were not only entomological, but observations on vegetable physiology, ornithology, and in fact on almost every branch of Science in any way connected with agriculture. He was the author of a series of elementary scientific manuals; and in 1875 a splendid work on humming-birds was issued from his pen. These various publications serve to show the general scientific knowledge possessed by this eminent entomologist. As an entomologist, Mulsant studied principally the Coleoptera and Hemiptera of France, more especially the former. Possibly no man has contributed more to the natural history of Coleoptera than Etienne Mulsant. He was a good scientific entomologist, and an excellent observer of the natural habits and life-histories of various species. His 'Histoire naturelle des Coléoptères de France' is a fitting monument to his memory. This appeared originally in twenty-seven distinct parts, or monographs, published either in the Annals of the Linnean or the Agricultural Societies of Lyons, and later republished in separate form at Paris. This great work commenced with the "Longicornes" in 1839, and the last part appeared in 1878. Like many great undertakings it remains unfinished, notwithstanding that forty years' continuous and laborious work had been spent upon it. An instalment made its appearance about every other year, consisting of some hundreds of pages of letterpress and several plates, illustrative of minute structural details, &c. In the compilation of the latter half of this history—since 1863—Mulsant has had a fellow-worker in M. Rey. In 1879 the Prix Dollfus was awarded for this work to the talented authors, MM. Mulsant and Rey, by the Entomological Society of France. Mulsant and Rey commenced a monograph of the Hemiptera (Rhynchota) on a similar plan, under the title of "Histoire naturelle des Punaises de France." Five volumes are published (Lyon, 1865—79). Etienne Mulsant contributed a very large number of articles on the metamorphoses of Coleoptera and "Notes pour servir à l'histoire de ——" to the Agricultural and Linnean Societies of Lyons; to the Memoirs of the Academy of Science, of which he was a corresponding member; and occasionally to the "Annales" of the French Entomological Society, being elected a member in its first year, 1832. These were mostly collected in his 'Opuscules Entomologiques,' pubished at Paris, in sixteen volumes (1852—1875). Many of his memoirs were written in conjunction with other entomologists—Bourcier, Wachanru, Guillebeau, Gacogne, Godart, Victor Mulsant, Mayet, Perroud, Revelière, Lichtenstein, Pellet, and especially Rey. The Royal Society's Catalogues give 261 separate publications. Mulsant was president of the Linnean Society of Lyons, honorary member of the Belgian Entomological Society, a member of the Vienna Society, &c. The list of Mulsant's entomological articles, commencing in 1830, is very long, and, despite the inevitable, we can but regret that it is now closed; still, much as we may regret that so much knowledge is gone from us, we must rejoice that so much is preserved: *litera scripta manet.*—E. A. F.

Achille Guenée.—Last year's volume of the 'Entomologist' contained obituary notices of Boisduval and Berce (Entom. xiii. 119). It is now our melancholy duty to chronicle the death of another veteran French Lepidopterist. M. Guenée died, exactly a twelvemonth after his colleague Boisduval, on December 30th last, at Chateaudun, Eure-et-Loire. Possibly of all European lepidopterists Guenée's name was best known in this country, and especially to our readers. Since Henry Doubleday's 'List of British Noctuæ, according to Guenée's arrangement' (Entom. i. 377—81, October, 1842), Guenée's name has occurred more or less frequently in every volume of this periodical. He was of great service to Doubleday in his determination of our British species, thus assisting in the correction and simplification of our nomenclature, and in identifying for him Hübner's and his own types; while on the other hand Guenée obtained a good knowledge of our peculiar British forms and varieties through Doubleday. The list of Guenée's separate publications is somewhat lengthy: the Royal Society's Catalogue mentions forty-seven down to 1873, and six have appeared since; the last in 1879, when his health completely broke down. These are all on Lepidoptera, and are by no means of equal merit; but some, especially his earlier productions, are of great value. With but one or two exceptions they all appeared in the French "Annales," commencing in 1832. His most important work was the "Spécies général des Lépidoptères," commenced by Boisduval, and published in the 'Suites à Buffon.' Volumes five to ten were written by Guenée (Paris, 1852–7), who thus did much to improve our knowledge of the European Noctuæ and Geometræ. He also worked at the Micro-Lepidoptera, with good results among the larger species; his "Index" was published as early as 1845; and his last article (1879) treats of this group. Guenée was an advocate by profession, and was in his seventy-second year when his death occurred. He was one of the honorary members of our Entomological Society, elected in June, 1874; this is the first vacancy since Zetterstedt's death in 1874. His death causes a similar vacancy in the French Entomological Society, which he joined in 1832, though not an original member, and was accorded the higher distinction in 1874. Another gap is thus again made in the ranks of French entomologists —E. A. F.

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CONTRIBUTIONS TO THE HISTORY OF THE BRITISH PTEROPHORI.

By Richard South.

"Oh! it is only a plume." With this observation, I venture to say, many collectors of Lepidoptera would, on netting a species of the interesting *Pterophoridæ*, turn out the capture. This might be an example of the common but extremely graceful *Pterophorus pentadactylus*, or the unattractive and local *P. zophodactylus*, both failing to arrest sufficient attention to obtain insertion in the cabinet of their captor. Or possibly, supposed difficulties in the way of setting such "leggy beasts" operate as a barrier to this honour.

If the few remarks I am about to offer by way of introduction should haply be the means of enlisting more friends for the British Pterophori, my object will be achieved. I am sure much pleasure will be derived from a study of the group.

As compared with our larger groups of Tortrices and Tineæ, Pterophori do not show up very favourably as regards numbers in our fauna. The known British species are very limited. Thirty-six only are enumerated in our lists. These are divided into two families and three genera, of which the genus *Pterophorus* alone contains thirty-four species, leaving one only to each of the other genera.

The subjoined synonymic list of British Pterophori as they now stand is in accordance with Doubleday's arrangement:—

PTEROPHORI.

PTEROPHORIDÆ, *Zell.*
AGDISTES, *Hub.*
  Bennetii, *Curt.*
PTEROPHORUS, *Lat.*
  Rhododactylus, *W. V.*
Dichrodactylus, *Muhlig. ?*
Ochrodactylus, *Hub.*
  Pallidactyla, Haw.
Bertrami, *Roessl.*
Isodactylus, *Zell.*

Trigonodactylus, *Haw.*
Zetterstedtii, *Zell.*
Acanthodactylus, *Hub.*
Calodactylus, Steph.
Punctidactylus, *Steph.*
Cosmodactylus, Herr.-Sch.
Parvidactylus, *Haw.*
Microdactylus, Steph.
Hieracii, *Zell.*
Teucrii, *Greening.*
Lætus, *Zell.*
Pilosellæ, *Zell.*
Phæodactylus, *Hub.*
Lunædactyla, Haw.
Serotinus, *Zell.*
Bipunctidactylus, Haw., D. L.
Aridus, *Zell.*
Plagiodactylus, *Fisch.*
Zophodactylus, *Dup.*
Loewii, Zell.
Hodgkinsoni, *Gregs.*
Pterodactylus, *Linn.*
Fuscus, Retz.
Fuscodactylus, D. L
Lithodactylus, *Tr.*
Similidactylus, Dale.
Monodactylus, *Linn.*
Pterodactylus, Haw., D. L.
Lienigianus, *Zell.*
Tephradactylus, *Hub.*
Osteodactylus, *Zell.*
Microdactylus, *Hub.*
Paludum, *Zell.*
Brachydactylus, *Tr.*
Galactodactylus, *Hub.*
Spilodactylus, *Curt.*
Baliodactylus, *Zell.*
Tetradactylus, *Linn.*
Leucodactylus, W. V.
Pentadactylus, *Linn.*

ALUCITIDÆ.

ALUCITA, *Linn.*
ORNEODES, *Lat.*
Polydactyla, *Hub.*
Hexadactyla, Linn.!

The larvæ, I believe, are less known than the imagines. In future contributions I shall give specific descriptions. For the present purpose, it will suffice to state the general characteristics of the larva of the genus *Pterophorus*. It has sixteen legs, and is more or less fusiform in shape. The body colour is generally some shade of green. The dorsal stripe or line red, brown, or green. There are several warts on each segment, from which a few hairs of variable length are emitted. It does not spin any cocoon, simply fastens itself to a leaf, twig, or stem, by the anal extremity, and changes to a pupa. Sometimes the pupa also is hairy.

Though most of the species are very retired in their habits, both imagines and larvæ are not difficult to obtain, when a clue is found to their whereabouts. When one is "flushed," a diligent search should be made, as others are almost certain to be near.

Plumes occur in a variety of situations. Downs, fens, marshes, woods, hedgerows, &c.; the various localities yielding various species.

On downs *P. parvidactylus* may be observed; a sharp eye and quick hand are necessary to effect its capture on the wing; for though of but small size, it is exceedingly nimble. The larva feeds on thyme, but it is rather slow work searching for this little fellow. I would suggest collecting sprigs of the plant from places where the insect is known to occur; where thyme grows plentifully, a good bundle might be gathered in May, from which *P. tetradactylus* as well as the above would possibly be obtained.

P. spilodactylus occurs freely amongst its food-plant, *Marrubium vulgare*, on downs at Freshwater, in the Isle of Wight. The plant used to be common on the downs near Ventnor, but is of rare occurrence there now. In several cottage gardens in the island where the wild herb has been transplanted, the insect is to be obtained. The larvæ and pupæ may both be found by day on the upper sides of the leaf, often a large number on a plant. *Marrabium*, I believe, is not often found wild in other parts of England, but where known to grow wild or cultivated this plume should be looked for.

Fleabane (*Inula*) in marshes and other damp places should produce *P. lithodactylus*. The imago may be started from herbage in the daytime, but it is such a sluggish insect that nothing short of actual dislodgment will cause it to get on the wing; even this unwonted energy ceases when it has flown a few yards. Just after dark it becomes a little more lively, and flutters about over the larval pabulum, which I always find to be *Inula dysenterica*. When the leaves of this plant are observed to have a whitened appearance, due to the fleshy part being eaten away, the larvæ may be found if looked for just after dark. They come from their hiding-places at this time. I could never find them in the day, although I knew that they were close at hand, from the evidences of their recent feeding. Young larvæ are to be found in the primary shoots; and it has just occurred to me that possibly when the leaves are fully expanded, they may enter the stem to hide during the daytime. I have frequently pulled up plants, shook them, examined the ground, stones, &c., but never thought to split the stems.

Pterophorus isodactylus and *P. microdactylus* are also to be found in marshes; the former amongst *Senecio aquaticus*, in stems of which the larva feeds. Probably it may affect other plants of the tribe of ragworts. The last-named plume occurs among and near *Eupatorium cannabinum*, the food-plant of the larva, which also feeds in stems.

In salt marshes *Agdistes Bennetii* may be found; the larva feeds on *Statice limonium*. This is the only British representative of the genus, and may be known by the uncleft wings.

Where there is much golden-rod in woods, *Pterophorus tephradactylus* and *P. osteodactylus* are likely to be met with. They seem to be somewhat local. The larvæ feed upon the golden-rod, and are to be found thereon from September to May. A free overhauling of the plant in various districts may result in giving new localities for these species.

From hedgerows, ditches, &c., several species are to be obtained. *P. rhododactylus*, I expect, will be found in many new districts, if looked for when the dog-roses are in flower. The larvæ will be mostly found in those flowers that are unable to expand, owing to the petals being fastened together with silk. The eye will soon get accustomed to the appearance of such flowers, and detection become easy. Every one examined must not, however, be expected to yield the object searched for, as the larva of *Cheimatobia brumata* is frequently found lurking within; also odd examples of *Cosmia trapezina*, which in that case assumes the colour of the petals of the rose. A leaf spun with silk to a bud sometimes hides the quarry. I have found the larvæ on garden roses.

Burdock should produce *P. galactodactylus*, as the larva feeds thereon. Examine the under sides of the leaves. If the stems of *Origanum vulgare* are noticed to be partly bitten through, the larva of *P. baliodactylus* should be looked for. The imago flies at dusk. Hedgebanks and ditches will also yield *P. serotinus* among *Galium mollugo*. *P. pentadactylus* is more frequently observed than any other species of the group; in fact, it is hardly possible to fail seeing the "skeleton" moth, as I have sometimes heard it called. I have beaten the larva from nettles as well as convolvulus. *P. monodactylus* is another convolvulus feeder. The imago is often found in gardens in the autumn.

Among *Ononis* may be found *Pterophorus acanthodactylus* and *P. phæodactylus*. The larvæ of both species are best obtained by beating, where that is practicable.

Larvæ of *P. acanthodactylus* have been found feeding on geraniums in a garden. It is also the common plume of the northern moors, where it feeds on *Calluna vulgaris*.

P. trigonodactylus is generally common where coltsfoot is well established. The larvæ feed in the flower stems in March.

Alucita polydactyla is frequently met with, hybernating in outhouses, and in the spring and autumn among honeysuckles, on which the larva feeds.

Most of the foregoing will be obtained by those who care to look for them, during the coming season, and possibly some others of the group.

A few words about "setting" may not be out of place. There is no real difficulty in the satisfactory manipulation of a *Pterophorus* or even of an *Alucita*, provided the insect is in a proper relaxed condition after death. If it is in the least stiff, the legs will be as brittle as glass, snapping off when touched, in the most vexatious and tantalising manner. The feathers of the wings will, moreover, refuse to unfold; a state of things calculated to deter one from any further attempt to become better acquainted with the group.

I use strong liquid ammonia for killing all my insects, except green ones, and even some of these are in no way hurt by it. As far as my experience goes, it is certainly the best agent I know of for successfully killing insects. There may be objections to its use; I have not found any, and even if I had, the splendid flaccidity of specimens under its action would more than balance matters.

Pterophori killed with ammonia may remain in the jar (of course in boxes) all night, and when turned out next morning should be left for about half an hour before pinning. By the way, care must be taken in the latter operation, or legs will be pushed off with the pin's point; let this show quite a quarter of an inch under the thorax. In putting the specimen on the setting-board, do not press the pin far into the cork at first, only just far enough to hold firm whilst the legs are got out of the groove, and drawn partly into position. This being done, press down in the usual fashion, and arrange the legs finally. The wings will be found to spread easily enough.

If the black pins lately introduced by Mr. Meek possess the virtue claimed for them, they are the very things for the insects in question, for unfortunately some of the species are very prone to set up verdigris.

As I stated before, I shall in my next paper describe some of the species, their larvæ and habits. I hope during the year to give an account of the larger proportion of this group.

(To be continued.)

NOTES ON OAK-GALLS IN THE QUERCETUM OF THE ROYAL BOTANIC GARDEN, KEW.

By R. Allen Rolfe.

Our British oak-galls are necessarily confined to the one species of oak indigenous to the country, but where numerous species are growing in close proximity it is not surprising to find that certain galls spread and flourish on other species than our own, namely *Quercus Robur*. Such has been the case in the Quercetum here, and a few notes of the same are now offered to the readers of the 'Entomologist.'

Quercus Robur, L.—This oak has been split up and made into several species by different authors, but they can only be considered as well-marked varieties. DeCandolle, in his 'Prodromus,' makes two subspecies,—*pedunculata*, fruit-stalked; and *sessiliflora*, fruit sessile,—arranging the varieties under them in accordance with the presence or absence of a peduncle to the fruit; intermediate forms, however, occur with peduncles of various lengths. *Q. pubescens* he places under *sessiliflora*, as the fruit is sessile; but as there is a pubescent variety with pedunculate fruit, and the amount of pubescence varies on some forms of *sessiliflora*, I shall treat them as varieties only, enumerating the galls found on each.

Var. Q. PEDUNCULATA, *Willd.*

Neuroterus numismatis, Ol.—Common.

N. lenticularis, Ol.—Very common.

N. fumipennis, Hart.—Generally distributed, and fairly common.

N. læviusculus, Schenck.—I have only found this gall on one small tree; two leaves are infested, the galls numbering seventy-nine; two leaves the previous year with nineteen galls.

N. ostreus, Hart.—Fairly common.

Spathegaster baccarum, L.—Common.

Andricus curvator, Hart.—Common.

A. inflator, Hart.—Not rare.

A. terminalis, Fab.—Common.

Cynips Kollari, Hart.—Common.

Dryophanta divisa, Hart.—Not rare.

D. scutellaris, Ol.—Not rare.

Aphilothrix gemmæ, L.—Fairly common.

A. autumnalis, Hart.—Two specimens.

A. callidoma, Hart.—Rare, on a small tree.

Var. Q. Haas, *Kotschy.*

S. baccarum, L.—Not rare.

C. Kollari, Hart.—Not rare.

Var. Q. FASTIGIATA, *Lam.*

N. lenticularis, Ol.—Rare.
S. baccarum, L.—Not common.
C. Kollari, Hart.—Very abundant.
A. gemmæ, L.—Rare.
A. callidoma, Hart.—Rare.

Var. Q. PURPUREA, *Loud.* (Purple variety.)

S. baccarum, L.—Rare.
A. terminalis, Fab.—Not rare.

Var. Q. PENDULA, *Loud.* (Weeping variety.)

S. baccarum, L.—Rare.

Var. Q. LACINIATA, *Lodd.*, v. *heterophylla*, Loud., v. *filicifolia*, Hort. (Fern-leaved variety.)

N. numismatis, Ol.—Abundant.
N. lenticularis, Ol.—Common.
S. baccarum, L.—Rare.
C. Kollari, Hart.—Not rare.

Var. Q. SESSILIFLORA, *Sal.*

N. numismatis, Ol.—Not common.
N. lenticularis, Ol.—Common.
N. ostreus, Hart.—Rare.
S. baccarum, L.—Common.
A. terminalis, Fab.—Rare.
C. Kollari, Hart.—Fairly common.
D. divisa, Hart.—Rare.

Var. Q. CONCORDIA, *Hort.* (Golden-leaved variety.)

N. lenticularis, Ol.—Three specimens.

Var. Q. DALECHAMPII, *Ten.*

N. numismatis, Ol.—Rare.
N. lenticularis, Ol.—Rare.
S. baccarum, L.—Not rare.

Var. Q. PUBESCENS, *Willd.*

N. lenticularis. Ol.—Rare.
S. baccarum, L.—Not common.
C. Kollari, Hart.—Not common.
A. terminalis, Fab.—Common.

Q. TOZA, *Bosc.; Q. Tauzin*, Pers.; *Q. pyrenaica*, Willd.; *Q, lanuginosa*, Lam; *Q. pubescens*, Brot. (non Willd.)—This is a very distinct oak; in the spring the young leaves and shoots are covered with a dense pubescence of white hairs, giving the tree a woolly appearance; three species of gall-insects seem to thrive well on it.

N. lenticularis, Ol.—Common on several trees.

S. baccarum, L.—About the same as the last.

C. Kollari, Hart.—Abundant, too much so for the good of some small trees.

Q. LUSITANICA, *Webb.* (The Portuguese oak.)

N. lenticularis, Ol.—Common on a good sized tree; in 1879 it was rather less common; and I have been told it was plentiful in the previous autumn. I have also seen a specimen of this oak, gathered in 1864, with several of these galls on.

N. fumipennis, Hart.—Not rare in 1879, but I have not seen it this season.

S. baccarum, L.—I examined the tree very minutely several times in 1879 for this gall, thinking it might throw some light on the dimorphic theory, which, if a reality, ought to have produced it, as *N. lenticularis* was common in the previous autumn, and the tree is isolated; my search proved unsuccessful, but this season I was rewarded by finding two galls on one branch, but could discover no more.

D. divisa.Hart.—Half a dozen good specimens.

Var. Q. TURNERI, *Willd.; Q. lusitanica*, var. *Clusii*, DC. (Turner's oak). —Supposed to be a hybrid, raised by Mr. Spencer Turner in the Holloway Down Nursery, Essex. A handsome evergreen oak, placed by DeCandolle under *lusitanica*, though I think the old name should be retained in preference to *Clusii*.

N. numismatis, Ol.—Very abundant, literally swarming on the lower leaves, though a small proportion only come to maturity: the rest I imagine are affected by parasites; they are smaller than on *Q. Robur*.

C. Kollari, Hart.—Very common, both this and last season; numbers of the galls which, I believe, are affected by inquilines, do not get larger than a pea, but, instead of the typical form, they are lengthened and have an attenuated, or more correctly an acuminate point; intermediate forms occur, or they would be taken for something else; probably breeding will throw light on this point.

D. scutellaris, Ol.—I have one gall which is undoubtedly this species; it is beautifully suffused with rose-colour, and has preserved the tint in drying, though I fear it will ultimately vanish.

Var. Q. INFECTORIA, *Oliv.*—This is well known as the oak which produces the galls of commerce. DeCandolle places it with *lusitanica* as a subspecies, and, though the tree has a different appearance and is considerably dwarfer, the fruits are almost identical.

N. numismatis, Ol.—Over a dozen galls.

N. lenticularis, Ol.—Slightly commoner than last species.

N. ostreus, Hart.—Three specimens.

S. baccarum, L.—Not rare on several trees.

A. curvator, Hart.—Ten specimens.

QUERCUS GLANDULIFERA, *Bl*—This is an evergreen Japanese oak extensively planted at Kew, where it forms dwarfish pyramidal bushes. It exists in nurseries, and has been distributed under the name of *Q. Austriaca hybrida*; but as *Austriaca* is a synonym of *Q. cerris*, it is evident the name is totally wrong. It was figured for the first time in 'Gardeners' Chronicle' for December 4th, 1880, p. 715. It is interesting to note that galls are found on it.

S. baccarum, L.—Common on several trees both in 1879 and 1880, though, as far as I could see, it was confined to the leaves. I bred the maker, also that common parasite *Callimome auratus* from the galls.

A. curvator, Hart.—Several specimens were found in 1879, though I did not observe any in the following season.

D. divisa. Hart.—Occurred sparingly in both seasons.

A. gemmæ, L.—One specimen in 1879.

Q. CERRIS, *L.* (The mossy-cupped oak).

Andricus glandium, Gir. — Occurred sparingly in the acorns of this species on one large tree in 1879.

Var. Q. LUCOMBEANA, *Loud.* (the Lucombe oak). — A hybrid between *Q. cerris* and *Q. suber*, raised in the Fulham Nursery, Exeter, by Mr. Lucombe, from seed sown about 1762.

A. glandium, Gir.—Most abundant in 1879 on the large tree near the wire fence; nearly all the acorns were galled, and when they fell in November could be gathered from underneath the tree by hundreds. In a large quantity I collected, the larvæ are still quite healthy and appear neither more nor less likely to assume the perfect state than when collected. This is a curious problem, as the galls appear annually (since 1877), but Mayr notices the fact as quoted 'Entom.' xi. 206, also Miss Ormerod (Entom. xi. 204). Mr. Fitch also wrote me that he has some from the same tree, collected in 1878, in the same condition [still living larvæ—E. A. F.] They probably emerge in the natural state in spring or early summer, and lay their eggs in the young acorns; and these conditions have not been imitated artificially. It is perhaps worthy of note that when in early spring I tried to collect others to see if they were more fully developed, I found something had extracted the larvæ, and nothing but empty galls remained; probably birds or mice in the severe weather,—it looked most like the latter,—but in a large handful of acorns I could not find a single larva remaining. Last autumn the galls were very scarce on the large tree, but were found on a small tree in the oak collection by the river-side. I also noticed that the galled acorns do not reach the full development, but remain in the cup, and do not fall from the tree till some time after those not attacked, and which consequently develop and ripen in the usual manner.

The following shows the botanical range of the galls which affect other oaks than *Q. Robur*; all were found on that species:—

N. numismatis, Ol., found on *Q. Turneri*, Willd., and *Q. infectoria*, Oliv.

N. lenticularis, Ol., found on *Q. Toza*, Bosc., *Q. lusitanica*, Webb, and *Q. infectoria*, Oliv.

N. fumipennis, Hart, found on *Q. lusitanica*, Webb.

N. ostreus, Hart, found on *Q. infectoria*, Oliv.

S. baccarum, L., found on *Q. Toza*, Bosc., *Q. lusitanica*, Webb, *Q. infectoria*, Oliv., and *Q. glandulifera*, Bl.

A. curvator, Hart, found on *Q. infectoria*, Oliv., and *Q. glandulifera*, Bl.

C. Kollari, Hart, found on *Q. Toza*, Bosc., and *Q. Turneri*, Willd.

D. scutellaris, Ol., found on *Q. Turneri*, Willd.

D. divisa, Hart, found on *Q. lusitanica*, Webb, and *Q. glandulifera*, Bl.

A. gemmæ, L., found on *Q. glandulifera*, Bl.

The absence of *N. lenticularis* from *Q. glandulifera* surprised me, perhaps more than anything, as the tree is common and generally distributed throughout the garden, and *S. baccarum* was common in both seasons.

I took special pains to satisfy myself on this point, and went over several trees repeatedly at intervals, the reason being to throw light on the dimorphic theory, if possible; if *N. lenticularis* is only the agamous generation of *S. baccarum*—of which I do not feel satisfied either *pro* or *con*—it ought to occur. On the North-American oaks planted largely—especially *Q. rubra, coccinea, Phellos, aquatica, nigra*, and *palustris*—I only found one gall, and that none of the foregoing: it may be new to Britain, and is on the upper side of the leaf. With *Q. cerris* the same thing occurred; it would perhaps be unworthy of note, except that in two or three instances galled branches of *Q. Robur* touched those of that species, thereby giving every facility for spreading to it.

The foregoing notes are offered as a small contribution to our knowledge of gall-distribution; though obviously incomplete,—many species being absent altogether, a fact partly attributable to neglect of the species which appear in early spring,—still I hope they are sufficient to show what an interesting field presents itself for research. The oaks have all been compared with specimens in the Kew Herbarium to avoid errors in nomenclature, a point I would urge as important in future observation. Excepting a few of the galls found on varieties of *Quercus Robur* and that of *Aphilothrix gemmæ* on *Q. glandulifera*, all are now in my collection. I hope next season to pursue the subject further; should anything of interest occur, it will form matter for future notes.

Royal Herbarium, Kew, Surrey, Dec. 8, 1880.

INTRODUCTORY PAPERS ON *ICHNEUMONIDÆ*.

By John B. Bridgman and Edward A. Fitch.

No. II.—ICHNEUMONIDÆ (*continued*).

The *Ichneumones amblypygi* have been tabulated by Holmgren as follows:—

A. Abdomen oblong or oblong-ovate, depressed, or towards the apex slightly compressed.
a. Abdomen of female showing 7 segments, the 8th not exserted; antennæ of male not having the flagellum externally dilated.
* The legs, in relation to their relative lengths, normal.
† Scutellum moderately convex.
‡ Apex of clypeus truncated.
§ Tarsi setose beneath. - - - Gen. 2. *Amblyteles*, Wesm.
§§ Tarsi with very short pubescence, especially in the females; no bristles, or next to none. - - Gen. 3. *Hepiopelmus*, Wesm.
‡‡ Apex of clypeus subangulated. - Gen. 4. *Acolobus*, Wesm.

†† Scutellum almost pyramidal.

o Apical margin of the clypeus obtusely subangulated in the middle. Gen. 5. *Trogus*, Panz.

oo Apical margin of clypeus straight. - Gen. 6. *Automalus*, Wesm.

** Anterior legs, in proportion to the hinder, rather short, hinder rather stout; tibiæ sometimes subarcuated.

× Above the collar two deep pits, these separated by a little keel or tubercle. Tarsi in both sexes simple. Gen. 7. *Anisobas*, Wesm.

× × Impression of the collar simple. Claws of tarsi in the female pectinated or serrated; male simple. Gen. 8. *Listrodromus*, Wesm.

b. Abdomen of female has the 8th segment shortly exserted; antennæ of male has the 10th to 14th joints of the flagellum subdilated. Tibiæ slender, hinder somewhat bow-shaped. Gen. 9. *Hypomecus*, Wesm.

B. Abdomen of the female compressed; apex subtruncated. Gen. 1. *Limerodes*, Wesm.

The females of this subfamily are easily distinguished by the last ventral segment reaching nearly or quite to the apex of the abdomen, and completely covering the base of the aculeus. The males are not so easily distinguished; the 4th ventral segment, sometimes also the 3rd, or more rarely all the segments, are destitute of the elevated fold; but some have the fold on the 2nd to 4th segments, as *Ambl. fasciatorius*, *A. notatorius*, *A. oratorius*, *A. palliatorius*, *A. spoliator*, and *A. litigiosus*. Some of the males, *Ambl. pallidicornis*, *A. vadatorius*, *A. glaucatorius*, *A. Gravenhorstii*, *A. amatorius*, have the last ventral segment at the apex acuminated. A few have the antennæ slightly thickened and subserrated, *Ambl. divisorius*, *A. fossorius*, and especially *A. flavocinctus;* or incrassated in the middle, *Hyp. albitarsis*.

In the following table some of the distinctions are taken from the size of the gastrocæli, or those pits at the base of the 2nd segment of the abdomen. To save much repetition, by gastrocæli small is meant that the space between is generally wider than the middle area of the post-petiole; the post-petiole is generally divided into three parts, two lateral and a middle area. Gastrocæli large means that the space between them is less than, or about equal to, the width of the middle area of the post-petiole. The areæ of metathorax, either three or five, alludes to the upper surface between the scutellum and the slanting part of the metathorax. On reference to fig. 2 of the plate, the supero-medial area is denoted by fig. 1, and there are two lateral areæ on each side, forming five areæ (see also fig. 3^{b}); when the cross line dividing each lateral area is absent, then there are but three areæ (see also fig. 3*). The posterior areæ are in the same figure divided into three by two distinct lines; fig. 2, 2 is the postero-medial area. The varieties are referred to as in the *Oxypygi*.

LIMERODES, *Wesm.*

Abdominal segments 1st to 3rd or part of 4th red, remainder black; legs red; apex of hind femora and tibiæ black.
A. Scutellum white; coxæ black.
1. *arctiventris*, 5—5½ lines, male and female.
B. Scutellum black; coxæ red; base of hind tibiæ also black.
2. *cambrensis*, 3¾—4 lines, male.

A *Limerodes* is at once recognisable by its long, slender, compressed abdomen. *A. arctiventris*, Boie, is well figured, with details of abdomen and head, on the plate illustrating Wesmael's 'Ichneumones Amblypygi Europæi' (figs. 1–4). This species has been bred from *Eubolia mensuraria* (Boie), *Miana literosa* (Brischke), *Tapinostola Elymi* (Brischke), and Vollenhoven says from a grass-feeding Noctua, probably one of the *Leucanidæ*. It is not common in Britain. Although Desvignes said that his *Ichneumon cambrensis* belonged to the *Pneustici*, it is certainly a *Limerodes*; there are two specimens of it in the British Museum, captured near Milford Haven.

AMBLYTELES, *Wesm.*

SECTION 1.—Scutellum and abdomen black.

Legs red; coxæ and trochanters black; hind tarsi brown (female and male). - - - - - - 27. *castigator*, 7½—8½ lines.

SECTION 2.—Scutellum pale; abdomen black.

A. Gastrocœli large (females).
a. Areæ of metathorax, three.
* Femora entirely or partly red, sometimes blackish.
28. *fossorius*, 6—7½ lines (*h*, *t*, *l*, *a*).
** Femora black, front one sometimes partly red.
34. *funereus*, 5½—7½ lines.
b. Areæ of metathorax, five; front tibiæ partly pale.
36. *Proteus*, 11—13 lines.
B. Gastrocœli small; areæ of metathorax, five (females).
Tibiæ and femora reddish or fulvous; apex of hinder black.
12. *notatorius*, 7—9 lines (*a*).
A. Areæ of metathorax, five (males).
a. Femora and tibiæ dilute red or orange.
13. *subsericans*, 5½—7 lines (*h*, *s*, *a*).
b. Femora black. - - - - - 36. *Proteus*, 11—13 lines.
B. Areæ of metathorax, three (males).
* Abdomen with ventral fold; hind tibiæ towards the base straw-coloured. - - - - 28. *fossorius*, 6—7½ lines (*h*, *l*, *a*).

** Abdomen without ventral fold.
† Tibiæ white-ringed. - - - 34. *funereus*, 5½—7½ lines (*h*).
†† Femora and tibiæ red. - - - 39. *alticola*, 6½—7½ lines.

Section 3.—Scutellum more or less pale; abdomen black; apical segments generally pale.

A. 6th and 7th segments of abdomen white, a; or 7th only more or less white, b (females).
a. Hind femora black; tibiæ white-ringed. 8. *oratorius*, 6—7½ lines (*a*).
b. Femora and tibiæ red. - - 13. *subsericans*, 5½—7 lines (*s*, *a*).
B. 4th to 7th segments with white apical lines; femora and tibiæ fulvous (females). - - - - 11. *atratorius*, 6½ lines.

Section 4.—Scutellum pale, or with pale marks; some of the segments yellow; apex black.

A. Hind femora red; tibiæ pale (males).
a. 3rd segment with two basal lateral spots, or a basal band (or 2nd and 3rd more or less yellow, and one *var.*, 1st, 4th and 5th extreme apical margins pale). Gastrocæli small. Metathoracic areæ, five. 12. *notatorius*, 7—9 lines (*h*, *a*).
b. 2nd and 3rd segments orange; 2nd to 6th apical margins pale yellow (this species varies much, to abdomen quite black). Gastrocæli moderate. - - 35. *Panzeri*, 6 lines (*l*, *a*).
c. 1st to 4th segments pale orange, base generally black. Gastrocæli small; metathoracic areæ, five. 15. *equitatorius*, 5—6½ lines.
B. Hind femora black (males).
a. 2nd and 3rd segments, sometimes partly the 4th, yellow.
* Face yellow, sometimes black in the middle. 16. *litigiosus*, 5½—7 lines (*t*).
** Face black; orbits of eyes occasionally yellow. 24. *conspurcatus*, 7—7½ lines (*h*, *t*, *a*).
b. 2nd and 3rd segments orange.
* 1st to 5th segments, with the apical margins yellow (very rarely obsolete). - - - - 7. *amatorius*, 7½—8½ lines.
** 2nd to 6th segments sulphur-coloured at the apical margins; 2nd and 3rd sometimes black; apical margins sulphur. 35. *Panzeri*, 6 lines (*l*, *a*).
c. 1st to 4th segments yellow, base black or red; remainder varicoloured, yellow or red and black. 14. *crispatorius*, 6—8 lines (*t*, *l*, *a*).
d. 2nd to 6th segments with yellowish margins. 10. *flavocinctus*, 6—6½ lines.

BUTTERFLY HUNTING IN NATAL: ON THE COAST-LANDS.

By William D. Gooch, C.E.

A fine morning, a cloudless sky, and a shimmering haze over everything far and near,—which foretells a good day to see butterfly-life at its best. The summer heats are over, and the rains in late autumn have, but a few days finished, left Nature redolent of insect-life, of which the late summer broods still linger in somewhat tarnished glory, and the winter early broods are just out in their splendour. This day has been anticipated some little time, for our veteran fly-catcher, from the old colony,[*] has come up to Natal to see its life, and has come out to stay a day or two to see it in its butterfly form. Last night we had a short look in on the moths, but the end of a thunderstorm had spoilt our sugaring, and there were not many insects to be attended to this morning as the result of our operations, *Pacidara venustissima* being the only notable. To-day, as our intention is to do our neighbourhood thoroughly, I shall take my reader along with us, so far as I can by word-painting, and give him the "carte du pays" equally with my veteran visitor.

Our arrangements were, after a substantial breakfast at 10, to leave our house about 11, and working in a circuitous route, to reach a point some four miles away at about 4 p.m., where the cart was to meet us to bring us back, or perhaps the ladies would pick us up, and extending our drive we should see something of the neighbourhood by a cruise on wheels before returning home to dinner. We occupied the time from bath and "chota hazari," an institution somewhat recognised in Natal plantation life, till breakfast, by a desultory examination of my cabinets on the part of my visitor, with gossip and anecdote, and the arrangement of my over-night sugar captures, a very meagre set, by myself. Our breakfast, a combination of Eastern luxuries, in the way of curried this-or-that, with a cutlet, a salad, and a bottle or two of light wines from the West, and café noir to follow—Natal coffee seven years old and grown on the estate—was sufficiently substantial, and at the same time æsthetic, to satisfy even an entomologist.

At 11 sharp our boys present themselves in the verandah to assist in carrying such paraphernalia as we may require,—sweeping nets, forceps nets, killing bottles, larvæ tins, lengthening pieces to the rods for our *Nymphalid* sugar-sucking friends, and finally a snack for lunch. Their arrival is the signal for the termination of our meal, and the very pleasant gossiping conversation which is the essential accompaniment of our veteran's presence, and we prepare for our expedition by adopting what, to the English mind would be a sufficiently eccentric costume,—a sun-hat with a very considerable puggarie, and leathern gaiters and strong boots, being the most striking features. The former to protect one from the scorching heat, which the day promises; the latter, from the attacks of snakes, which although seldom seen are sufficiently numerous to make incautious movement, such as butterfly catching requires, a dangerous exercise, unless the lower limbs be well protected. Usually the sea breeze, which begins to blow about 10, is somewhat of a hurricane; but this morning there is only enough of it to make the insects more numerous in sheltered spots, and so facilitate our work instead of rendering it a labour. The ladies promise to meet us unless there is a thunderstorm coming up, which they will know before the cart starts, as thunderstorms, unlike anything else colonial, are punctual, and can always be seen approaching from the east by 2 p.m., if they intend to come at all.

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[*] Col. J. H. Bowker, the well-known South African authority and collector.

Our party—self, veteran, and three boys (one a coolie, the others Kaffirs)—leaving the house, which stands on the slope of a hill, follow one of our paths to a "break-wind" of natural bush, along the leeward edge of which I shall work my way up to a favourite corner, where certain things, if about at all, are sure to be found. Along the double row of orange trees we pass, but do not halt, although *Papilio Demoleus*, *P. Nireus*, and *P. Leonidas* are frequent; the two former are evidently egg-depositing: the veteran has already strolled along this in the morning and summed it up. As we reach the corner of the "break-wind," *Acræa Cynthia*, *Eurytela Hiarbas*, and *Junonia Clelia* are all found hovering about, and several good specimens are at once taken. *A. Cynthia* is in great numbers, fluttering and hanging settled on dead branches, and apparently, from the look of the specimens taken, only emerged from pupæ this morning, and all of one family. Those in copulâ are captured and noted. *E. Hiarbas*, with its short pendulum flight, oscillating round a mass of creeper, on which its larvæ no doubt may be found; although beating for a minute or two does not yield us any of them, but a good supply of ants, bugs, and spiders, whose powers of "making tracks," when they find themselves on the beating-net, are simply marvellous. A *Curculio* or two who lie, oppositely inclined, curled up stark, stiff and inanimate, in their peculiar fashion. Whilst we are beating, *P. Merope* first comes into view, and is unerringly taken by the veteran; his condition being doubtful, and as we know where plenty more are to be found, he is set free, and he retires with somewhat of a dubious flutter. On one side of us now as we advance up the hill is the "break-wind," and on the other an open clearing, formerly, alas, coffee, but now a grand crop of weeds, rank to a degree, and forming a tangle of creepers and undergrowth difficult to get through. We follow, however, a beaten "Kaffir path" between them, which enables us to move along easily, and from which we diverge right or left as the temptation presents itself. Our additions here are several *Pieridæ:—P. Saba*, *P. Severina*, &c., visiting the flowering weeds; *Acræa serena* on the open patches of scrub; *A. Protea* in the edge of bush; *Atella phalanta* travelling; *Charaxes Brutus*, male, which costs us a halt, and the use of a lengthening joint for the net to get near him, as he sticks close to the exuding gum on a "flat crown," accompanied by a few large flies, a *Cetonia* or two, *Crenis Boisduvalii* which also falls a victim to our raid, a couple of *Mantidæ* waiting for game, and a hornet, probably collecting material for his nest. *Nymphalis Zoolina*, also, is seen and not captured, as the plunge after him results in the disappearance of our veteran into a tangle of creepers covering a pit of rotten wood, ant-heap, and dust. Recovering, we see also several *Lycænidæ*; and the veteran marks a miss on *Caprona Canopus*. *Nisoniades Ophion*, however, startled by his energy at the miss, falls an incautious victim to his net, settling after his swooping flight, with outspread wings, under the leaves of a feathered spray of a bush-plant, just within easy reach. This spot yields also two or three more of this insect, male and female, which generally occurs in a family. Our boys have fished out a busy tribe of larvæ of *A. Cynthia* on the head of a *Lamium*, which is all spun together by them; as the insect and its transformations have been well worked out by me, after inspection the group is thrown back into the wilderness. A large branch of a tree, a *Ficus*, bearing some dozen of larvæ of *Bunæa forda*, also, is examined and left; and the larvæ of the small sphinx, *Sophura nana*, is collected from a patch of *Galium*, and put in the larvæ tins to be reared. *Diadema Misippus*, male and female, are captured circling over a vacant space with *J. Clelia* and *Anthocaris Evarne*, where dry gravel and sandy subsoil relieve the intense tangle of vegetation. *Philognoma Varanes*, with his sharp flight and Nymphalid dash, is taken as he settles on an outlying orange tree, the indication of an old patch of garden, which we are approaching; and here also we first see the black unspotted male of *Nymphalis Ethalion*, but high on the wing, and too lively to be taken, except at rest, by a twenty feet sweep, although we try it; but the hot sun and the manifest disinclination to be approached, leave him master of the situation. We are now pretty well up the hill, and after breasting the next hundred yards we come to "my" corner, protected from the north-east and east, the prevalent direction of the mid-day breeze. It is open to the west and south, and commands a most extended view, in which is seen Table Mount; near Maritzburg, on a clear evening, by sunset light, the Umgeni Gorges and the Inanda Hills are the distant features; and broken bits of sugar plantations, bush clearing, wooded hills, and grass-land with scattered *Mimosæ*, form the chief features of the mid-distance and foreground. At our back is the "break-wind" we have come up, whilst to our right is an old fruit garden hard by, and a patch of heavy brush on the other side, through which we shall descend the hill. On our left still remains the open clearing, equally weed-grown, and now yielding up from an infinity of inconspicuous flowers, as it shimmers in the mid-day heat, a hum of insects, a flutter of flies, and a scent of honey and musk combined, which induces a sense of "Dolce far niente," and a desire to halt in the shade protected from the sun, and get a little cool after the fatigue of ascent, catching as much of the sea breeze as the "break-wind," up which we have reached this spot, allows to percolate through.

Casting my eye towards a certain "flat crown," in a quiet corner, I am gratified by seeing my constant friend and habitué of this spot, *Pseudacræa Tarquinia*, floating and circling lazily around, with its mimic, *Acræa Aganice*, and *Danais Echeria*, all together. I call the attention of the veteran to the three, and he is puzzled to make them out. *Echeria* is soon captured. The others remain out of reach, and despite challenges with bits of projectile launched at them, seem about to escape us, when a *Pieris Cleodora* dashing past *P. Tarquinia*, and diving down from the heights above to the fields below, upsets the equanimity of our habitué, who follows him, and, alas, before he can return, is benetted and impaled by the veteran with great content; meanwhile *Cleodora* becomes mine. Here, also, the heavy and gorgeous moth, *Egybolia vaillantina*, although we have seen him before, first comes within range; and almost at the same moment our boys find a batch of its bright yellow and black larvæ on their food-plant in the bush. *Papilio Nireus*, the rapid traveller, passes us with a searching lurch, provocative of a try, although we don't want him; and *P. Merope*, again, is taken; this time, being in good condition, his fate is fixed, and he adorns the veteran's box.

(To be continued.)

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Papilio Machaon near Bristol.—A specimen of *Papilio Machaon* has just come into my possession, which was captured last June near Durdham Downs, Clifton. The specimen is minus its tails, and very much battered. It was given alive by its captor to the gentleman from whom I received it.—W. K. Mann; Clifton, Bristol.

Deiopeia pulchella in the Isle of Wight.—Last autumn, while searching for fossils on the foundered cliff of Hempstead Hill, in the Isle of Wight, I took a specimen of *Deiopeia pulchella*. When I first took the insect I was unaware of the rarity of the species. The specimen, which was in good condition, is now in the cabinet of T. S. Wilson, Esq., of Edgbaston.—C. Ashford; Christchurch.

Description of the Larva of Plusia V-aureum.—I have once or twice found the larva of this species myself, and in different years have received eggs or larvæ of it from Messrs. J. Gardner, of Hartlepool, and C. W. Richardson, of Wakefield; but it was not until 1878 that I had satisfactorily reared it through. The eggs are deposited in June or early in July, and are rather small for the size of the moth, round, but flattened above; the colour very pale dull yellow, with a few very minute brown dots. They soon hatch, and the newly emerged larvæ are greyish white, indistinctly spotted with black, and the segmental divisions smoke-colour. They feed on dead nettle (*Lamium*) and other low plants until autumn, when they commence hybernation, having attained the length of half to five-eighths of an inch. In spring they recommence feeding, and by the end of the first week in May are full grown, and may be described as follows:—Length about an inch and a quarter, and stout in proportion; head glossy, has the lobes rounded, and is narrower than the second segment; body cylindrical, and the segments from 4th to 12th inclusive, of nearly uniform size and width; the 13th segment is small and low, which makes the 12th have a raised and swollen appearance; from the 4th to the head, each segment becomes considerably smaller than the one behind it, giving the anterior of the larva a very pointed appearance; skin rough, and, as well as the head, clothed with a few scattered but rather stiff hairs; the segmental divisions are well defined; and, like others in the genus, there are only six prolegs. Ground colour of the body and head bright apple-green; the mandibles, and a rather broad stripe extending round each cheek, intensely black; dorsal line darker green than the ground colour, and edged on each side with two irregular interrupted white lines; these lines become confluent on the posterior segments, and, with the white encircled tubercles, give the appearance of a somewhat variegated pattern; there is also a very zigzag white line along the subdorsal region, and a white even line above the spiracles; spiracles oblong-oval, placed perpendicularly, cream-colour, encircled with brown; the hairs have the lower part cream-colour, the tips brown. Ventral surface, legs, and prolegs uniformly apple-green. The larva rests with the anterior segments raised from the food-plant, and the back arched like that of a Geometer, which gives it a rather grotesque appearance. Like its relatives, it spins a moderately compact white cocoon amongst its food-plant, through which the black chrysalis can be readily seen. The moth emerges in about a month—that is, in the middle of June.—GEO. T. PORRITT; Highroyd House, Huddersfield, February 4, 1881.

DESCRIPTION OF THE LARVA OF CIDARIA FULVATA.—This pretty moth occurs abundantly here on the sandhills amongst the Burnet rose (*Rosa spinosissima*, Linn.), which grows in large masses together with sea rushes, ragwort, hound's-tongue, &c. The larvæ were not uncommon about the beginning of June, but were not easy to obtain, on account of the rose bushes being of such stunted growth, and so mixed up with other plants, it was difficult to push a beating tray beneath the branches. About two dozen were beaten, and a few others found, after rain, drying themselves on exposed twigs. The following is a description of the full-grown larva:—Length, 1′ 2″ to 1′ 3″; head porrected and cordate, smaller than the second segment, pinkish yellow, with a few minute bristles; whole of the upper surface pale whitish green, becoming darker above the spiracles, and forming an indistinct streak; segmental divisions clearly defined, almost white, but in some examples pale yellow; four minute white dots on each segment; spiracles white; on fifth to eleventh segments inclusive, a conspicuous black dot just below the faint spiracular streak; under surface much paler; anal flap and claspers delicately tinged with pink. There are several varieties of this larva—in some the general colour is dark apple-green; head pinkish brown, with a dark blotch on each side of face; spiracular line purple; under surface yellowish pink; white dots raised and conspicuous; anal flap and claspers dark purple. Another variety is altogether purplish brown, with the ventral area whitish pink. In their various shades of colouring these larvæ bear a strong resemblance to the branches of their food-plant. When full fed, they descend to the ground and spin a cocoon of fine silk mixed with particles of sand just below the surface, in which they change into chestnut-coloured stumpy pupæ.—GERVASE F. MATHEW; Instow, N. Devon, December 17, 1880.

ODONESTIS POTATORIA *var.*—With reference to Mr. E. Lovett's notice in this month's 'Entomologist,' I beg to state that, while residing in Brittany in 1878, I bred from the larva a very fine variety of *O. potatoria*, a female, having all the colouring and markings of the male.—MRS. GERVASE MATHEW; Instow, North Devon, January 4, 1881.

EPUNDA LUTULENTA, *var.* LUNEBURGENSIS, IN LANCASHIRE.—Last September a fine specimen of the above variety came to light at Dutton. I did not pay much attention to it, but pinned it among some *Luperina testacea*, still thinking it too black for this species, and not like any *E. lutulenta* that I had ever taken. I called Mr. Capper's attention to it. We recognised it as Mr. Nicholas Cooke's moth from Inverness-shire. Here is another instance of the novelties which have turned up during the last two years in the heart of Lancashire. I appear to have had above my share of success. I have, however, left the district.—J. B. HODGKINSON; December 22, 1880.

COLEOPHORA MARINIELLA, *Hodgkn.*—Several of my friends ask me what the *Coleophora mariniella* of my list is. It is a *Coleophora* with anterior wings of a light dull brown, almost like some females of *C. viminetella*. The general appearance at once separates it from either *C. bicolorella* or *viminetella* by its non-metallic look. The face and head are of a pale ashy colour. The fore wings are more full and rounder than those of any of its congeners. I took five specimens near Fleetwood about seven years ago, and sent them all to Mr. H. T. Stainton, who replied that he did not recognise them, and asked me to try and find cases. As he did not consider it safe to name a species of *Coleophora* until the case had been identified, I have ventured to name it: it may be as long before the case of *mariniella* is found as was that of *C. Fabriciella*, which has not yet been found in perfection: I have known the latter insect for forty years. I still retain three specimens of *mariniella;* I gave one to Mr. Bond and the other to Mr. Mason.—J. B. HODGKINSON; 15, Spring Bank, Preston, January 17, 1881.

INSECTS REARED FROM LARVÆ COLLECTED ON THE ESSEX SALT-MARSHES.—*Tortrix latiorana* is, I think, considered merely a variety of *T. costana*, but the few specimens I reared in July last, from larvæ found on sea-lavender, differ so much, both in the colour of the larva and in the appearance of the moths, from the *T. costana* which I reared from black larvæ collected on various plants in the London districts, that I have now, doubts of their being one and the same species; future experience must decide the question. The larvæ of *Catoptria tripoliana* feed in the seed-heads of *Aster tripolium* in October; when full-fed they construct a tough cocoon from the down of the seed, in which they remain during the winter and spring, changing to pupæ shortly before the emergence of the moths, which takes place in July and August. A few *Eupœcilia affinitana* were reared among the preceding, their habits being very similar, but the imago appears about a month earlier. A fair series of *Gelechia obsoletella* were reared from larvæ found in October on sea-chenopodium and atriplex. *Coleophora artemisicolella* were bred from larvæ collected on *Artemisia maritima* in October. The larva of *C. salinella* occurred in profusion on both sea-chenopodium and atriplex, but comparatively few reached the perfect state. I had the pleasure of capturing one beautiful specimen of the scarce *Asychna æratella* on the marshes early in July. — WILLIAM MACHIN; 22, Argyle Road, Carlton Square, E., December 20, 1880.

LEPIDOPTERA ON THE FLOWERS OF BURDOCK.—While staying with a friend at Wateringbury, in Kent, during the latter part of July last, I took several specimens each of *Noctua rhomboidea* and *N. Dahlii* on the flowers of Burdock (*Arctium lappa*) growing on the edge of a common. This proved the only way in which we could obtain these two species, though we "sugared" diligently every night. We took a few *Hydræcia nictitans* also on the same plant, and *Noctua baja* positively swarmed at it, some good varieties occurring. I also took near the same spot a couple of *Acidalia straminata*.—[Rev.] CHAS. F. THORNEWILL; Burton-on-Trent.

QUERY AS TO SUGARING GROUND.—There is here an oak wood full of fine timber trees, with a dense and varied undergrowth. To the north and east lies a large park, but on other sides the wood is bounded by cornfields or meadows destitute of trees. Would a circle of trees to the north or east of the wood be likely to prove a profitable sugaring ground, or would it be better to take the trees in the wood? I have thought that, in the former case, whenever the wind should be in a favourable quarter for sugaring operations, it would carry the scent away from the wood where I suppose the best moths are. Would this be much against success?—CHAS. CANDLER; Harleston, Norfolk.

ANCHOMENUS MARGINATUS, *L.*—During December, 1880, Mr. Wood and myself captured eight specimens of this insect, by digging at roots of trees in Dulwich. I mentioned this to Mr. Billups, who was surprised at the occurrence of this insect so far inland, it being usually found within a mile or two of the coast. Dr. Power was also surprised at it, and suggested that they had been transported from the coast by the Chatham and Dover Railway, which has a station close by.—H. B. PIM; Leaside, Kingswood Road, Upper Norwood, February 2.

COREMIA QUADRIFASCIATA.—A specimen of this local insect was taken at light by a friend of mine, at Chiselhurst, in June last year. This is, I believe, a new locality for it.—H. B. PIM, Leaside, Kingswood Road, Upper Norwood, February 2, 1881.

MEGACRONUS INCLINANS, *Gr.*, AT DULWICH.—I took a specimen of this rarity at Dulwich, on the 30th November last, as it was hybernating under the roots of grass. According to the Rev. H. S. Gorham, who kindly identified the specimen for me, this is an old locality for the insect.—THEODORE WOOD; 5, Selwyn Terrace, Jasper Road, Upper Norwood. [I have taken a fair number of specimens—eight or ten—chiefly in the North of London, as at Highgate and Hampstead.—J. A. P.]

Note on leaf-mining Dipteron.—The subject of the life-history of the leaf-mining Diptera, so ably illustrated by Mr. Fitch in his instructive and learned paper on the "Mangold-fly," and published in the last two numbers of the 'Entomologist,' is so interesting, that any new facts bearing on the subject are worthy of record. In the appendix, which I had the pleasure of adding to Mr. Fitch's article, I placed the *Chortophila atriplicis* of Goureau among the synonyms of *C. betæ*, thus expressing the opinion that they were probably the same species, following the example of Haliday. This opinion is strongly supported by the fact that in November last I received a specimen of *C. betæ* from the Rev. E. N. Bloomfield, of Guestling Rectory, near Hastings, which he had bred from "larvæ feeding in bladdery mines on *Atriplex sp.* near the sea." Mr. Bloomfield has kindly promised to follow up this interesting occurrence by trying to find out next summer the name of the species of *Atriplex*, and also, I hope, to collect some more larvæ, and try to breed some more imagines. He also added, in a subsequent letter, "I have little doubt the sea beet was not far of" (from the *Atriplex*), "as I know it grows on the cliffs at no great distance from the place where I found these larvæ." I hope he may find some larvæ feeding upon the beet, as well as upon the *Atriplex*, and prove whether they both produce the same fly. In December last Mr. C. W. Dale sent me a specimen of Rondani's *C. chenopodii*, which he had bred from a larva mining the leaves of a dock. This, in addition to other facts of the same nature, leads me to believe that most of the leaf-mining flies are not strictly confined to one species of plant.—R. H. Meade; Bradford, Yorks., Feb. 18, 1881.

Vespa norvegica at Stamford Bridge.—On August 11th last, while collecting Coleoptera on umbelliferous plants at Stamford Bridge, near York, I captured a specimen of *Vespa norvegica;* as this seems one of the rarest of the British wasps, it is perhaps worth recording.—[Rev.] W. W. Fowler; Lincoln, Feb. 8, 1881.

Scientific Nomenclature.—To judge from the name proposed for the new Manx *Eupithecia*, we may expect ere long to be favoured with "Billana," "Pollyaria," and similar examples of modern English science and good taste. Surely some step might be taken to stifle these monstrosities at their birth, and to prevent its being in the power of collectors to debase Science by giving such ridiculous names, and then posing in dignity on priority?—C. A. Briggs; 55, Lincoln's Inn Fields, February 1, 1881.

[We quite agree with our correspondent, but do not consider it our province to stifle names which have previously appeared elsewhere.—Ed.]

Lancashire and Cheshire Entomological Society.—Th first meeting of the present session of this Society was held January 31, in the Free Library, William Brown Street; th president (Mr. Capper) in the chair. After the minutes of th previous meeting had been read and confirmed, the Societ elected the following officers for the current year:—President Mr. S. J. Capper; vice-president, Mr. Nicholas Cooke; secretary Dr. J. W. Ellis. After a vote of thanks to the retiring officers Mr. Capper, in the course of a few remarks, reminded th members that this was the fifth year of their existence, and tha they were to be congratulated upon their prosperity.—Ed.

Colorado Beetles in South Devon.—At the Yealmpto Police-court, on February 8th, Henry William Horton, a farme recently returned from Canada, was charged with having ha unlawfully in his possession certain living specimens of th Colorado beetle, which he had brought with him from Canad By section 5 of the Colorado Beetle Order of 1877, it is n lawful for any person to keep any living specimens in any stag of existence, under a penalty of £10. It was proved, an defendant admitted, that he had had living specimens—nearly score—feeding; but stated that he did not know he was doin wrong to bring a few specimens to show his friends, and that soon as he heard it was against the law to keep them he destroy them. He called a witness, who saw defendant throw a number eight or nine—into the fire. The Bench fined the defendant £ —Abridged from 'Western Daily Mercury,' Feb 9, 1881.

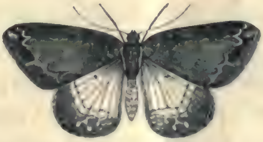
OBITUARY.

Walter Philip Weston.—It is with sincere regret we reco the death, in his twenty-ninth year, of our Correspondent, Walt P. Weston, which occurred on Sunday afternoon, February 20t at his residence, Auburn Villa, Putney. A notice of his entom logical work will appear next month.—Ed.

THE ENTOMOLOGIST.

Vol. XIV.] APRIL, 1881. [No. 215.

VARIETY OF *MELANTHIA ALBICILLATA*.



Melanthia albicillata *var.* suffusa.

The pretty variety of *M. albicillata*, figured above, was one of several imagines of this species reared from a batch of eggs by Mr. T. Meldrum, of Ripon, Yorkshire. It appears to be the counterpart of the variety *plumbata* (Curtis) of *M. rubiginata*, which occasionally occurs in the Highlands of Scotland. Having failed to discover this form described elsewhere, I propose to name it *Melanthia albicillata* var. *suffusa*. I have to thank Mr. Meldrum for the opportunity of figuring this example, and also for kindly adding it to my collection.

John T. Carrington.

Royal Aquarium, Westminster, S.W., March, 1881.

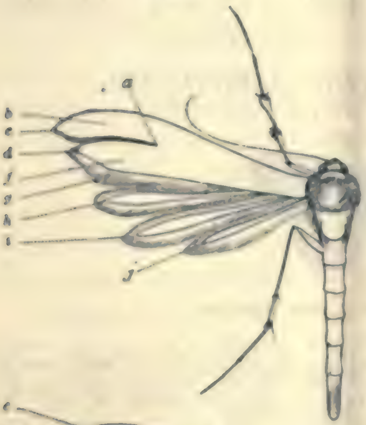
CONTRIBUTIONS TO THE HISTORY OF THE BRITISH *PTEROPHORI*.

By Richard South.

(Continued from p. 53.)

Life-histories of various species of British *Pterophori* have appeared from time to time in the pages of the 'Entomologist' and elsewhere, but these are so scattered as to be hardly convenient for reference, especially when it possibly happens that even the name of the species, about which we want to learn something, is unknown to us. The student of the larger groups of British Lepidoptera is assisted in his investigations by works treating of the particular group or groups he may wish to study, but should he be inclined to turn his attention to our species of *Pterophori* he is left very much to his own resources. It may be suggested that we have some account of the group in Mr. Stainton's 'Manual.' True; in that excellent epitome of British Lepidoptera, short descriptions are given of the imagos of some thirty species of "plumes," but no mention is made of their larvæ, except as regards the food-plant. The 'Manual' was published in 1859, and since that time, with the exception of the life-histories just referred to, no attempt has been made to give a systematic history of the British *Pterophori*.

FIG. 1.



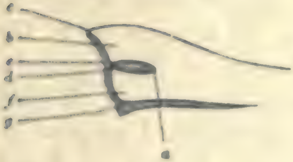


FIG. 2.

FIG. 1.—*P. lithodactylus*. *a*. digital juncture; *b*. outer digit; *c*. tip of outer digit; *d*. tip of inner digit; *e*. angle of outer digit; *f*. inner digit; *g*. angle of inner digit; *h*. 1st feather of hind wing; *i*. 2nd ditto; *j*. 3rd ditto.

FIG. 2.—*P. trigonodactylus*. — Anterior wing.

In describing, I shall not aim at the production of an elaborate scientific description; but I hope, by directing attention to the more important specific variations of formation and markings, to enable the student to determine his captures in this group with precision.

The initial step, in identifying a species of the *Pterophoridæ* in the imago state, is to note the structure of the anterior wings. These are—with the exception of *Agdistes Bennettii*—always more or less cleft on the hind margin, sometimes so deeply as to separate the wing into two distinct digits; in other cases only dividing the wing into two lobes. I propose to use the term "digit" in all my descriptions of the perfect insect, calling the part above the fissure the outer digit, and that below the inner digit (see figs. 1 and 2). The hind wings are divided into three distinct feathers; a difference of length, breadth, and coloration of these will often determine the identification of a species. The legs, too, which should always be carefully preserved, are sometimes important in separating nearly allied species; but only in such instances will special reference be made to them.

The accompanying figures will explain the terms which I shall hereafter use.

Anyone looking at a collection of our "plumes," and observing the various contour of the wings of the species embraced in the genus *Pterophorus*, of the British lists, would naturally conclude that they should be divided into several genera; and so, indeed, they would be in a European collection. There are always objections raised to any innovation in the way of revised nomenclature, when such change is applied to a species only; but when the division of a whole group is contemplated it is advisable to proceed carefully. I have therefore thought that, as most collectors use the "Doubleday" list, both for reference and in the arrangement of their cabinets, it would be better to defer the breaking up of the *Pterophori* as arranged in that list, more especially as I shall not be able to describe the species in the order of classification, but as I can obtain the larvæ. It will, however, be as well if I place before your readers the list as generally accepted by the continental lepidopterists. The arrangement is that of Mons. H. D. Wallingren, a Scandinavian entomologist of repute. It is as follows, so far as those occurring in Britain are concerned, and is somewhat modified from Dr. Wocke in Dr. Staudinger's Catalogue of 1871:—

CNÆMIDOPHORUS, Wallgn.
  Rhododactylus, W. V.

PLATYPTILIA, Hub.
  Dichrodactylus, Muhlig.
  Ochrodactylus, Hub.
  Bertrami, Roesel.
  Isodactylus, Zell.
  Trigonodactylus, Haw.
  Zetterstedtii, Zell.

AMBLYPTILIA, Hub.
  Acanthodactylus, Hub.
  Punctidactylus, Steph.

OXYPTILUS, Z.
  Parvidactylus, Haw.
  Hieracii, Zell.
  Teucrii, Greening.
  Lætus, Zell.
  Pilosellæ, Zell.

MIMÆSEOPTILUS, Wallgn.
Phæodactylus, Hub.
Serotinus, Zell.
Aridus, Zell.
Plagiodactylus, Fisch.
Zophodactylus, Zell.
Hodgkinsoni, Greg.
Pterodactylus, Linn.

ŒDEMATOPHORUS, Wallgn.
Lithodactylus, Tr.

PTEROPHORUS, Wallgn.
Monodactylus, Linn.

LEIOPTILUS, Wallgn.
Lienigianus, Zell.
Tephradactylus, Hub.
Osteodactylus.
Microdactylus, Hub.
Brachydactylus, Tr.

ACIPTILIA, Hub.
Galactodactylus, Hub.
Spilodactylus, Curt.
Baliodactylus, Zell.
Tetradactylus, Linn.
Pentadactylus, Linn.
Paludum, Zell.

I do not propose at present to comment upon the foregoing list, but I hope when I have got through the life-histories of our British species to return to this subject, and shall also have a few words to say about the present position of the group in the Doubleday arrangement of British Lepidoptera.

I said in my last paper that I would describe some of the species in my next contribution, but no doubt your readers will have observed at the head of the Exchange list, in the March number of the 'Entomologist,' that it is intended to give plates illustrative of the descriptions, showing figures of imago, pupæ, larvæ, and food-plant. This will obviously necessitate some little delay in the publication, which will proceed as fast as the necessary material for figuring comes to hand.

It may be reasonably assumed, when more observers are at work on the *Pterophori*, and the larvæ assiduously hunted for and collected, that not only will some of the rarities be deprived of their claim to be considered rare, but a new species or two may be added to our list. As a guide I will refer to three of our rarer and one continental species of *Pterophoridæ*. The larva of *Pterophorus brachydactylus* is said to feed on *Lactuca muralis* in June. I should, however, think it more likely to be found on *L. saligna*. This latter plant is not of such general distribution as *L. muralis*, but it occurs in those few places where the insect in question has been taken; therefore I shall not be considered to draw rash conclusions if I suppose the restricted range of *P. brachydactylus* to be due to its predilection for the scarcer species of *Lactuca*. I well know that "plume" larvæ found upon one species of a tribe of plants will also frequently feed upon other species of that tribe; but I also know that they evince a decided preference for one species, and are generally to be found only on that pabulum. On the Continent *Pterophorus lætus* is said to feed in June on *Andryala sinuata*, and *P. aridus* in April and May on *Coris monspeliensis*. Imagos of both species have occurred in this country; the former, in Norfolk, not unfrequently. *Pterophorus didactylus*, Z., feeds on the Continent in May on the flowers of *Geum rivale*. This plant seems to affect damp meadows and mountainous woods; in the Highlands it grows to an elevation of nearly 2800 feet. The larva feeds in the evening, and rests on the flower-stems by day. Neither larvæ nor imago have hitherto been observed in this country, but possibly may be discovered here in some habitat of the plant. The water avens (*Geum*) flowers during May, June, and July, in Britain.

In concluding this introduction to my contribution to the history of the British *Pterophori*, I venture to ask the co-operation of your readers during the coming season in assisting me to obtain larvæ, with the food-plants, for figuring. I shall only be too happy to acknowledge such assistance. These larvæ should be full grown, unless the younger forms differ materially from the adults. The paragraph on this subject, in the Exchange list, will give the necessary particulars. I think it probable that many larvæ of this group will be more easily found feeding after dusk; at any rate, I know such is the case with several species.

London, March 12, 1881.

INTRODUCTORY PAPERS ON *ICHNEUMONIDÆ.*

By John B. Bridgman and Edward A. Fitch.

No. II.—ICHNEUMONIDÆ (*continued*).

Section 5.—Scutellum pale; apex of abdomen and generally the middle spotted or banded with yellow or white.

A. 2nd and 3rd segments yellow or fulvous, with or without black marks (females).
a. Apical margins of remaining segments yellow.
* Metathorax armed with two acute spines; legs yellow and black varied. - - - - - - 5. *armatorius*, 6—8 lines.
** Metathorax not so armed.
† Gastrocæli scarcely perceptible; tibiæ, tarsi, and antennæ tawny-yellow; apex brown. - - - 6. *infractorius*, 6—7 lines.

‡‡ Gastrocœli very distinct: antennæ white-ringed: tarsi and tibiæ straw-yellow, apex of hinder black. 2. *trifasciatus*, 6—7½ lines.

b. 6th and 7th segments entirely, or margins, fulvous; tibiæ yellowish, apex of hind one black.

* Scutellum yellow. - - - - 1. *palliatorius*, 6—8 lines (*a*).

** Scutellum white. - - - - - *cerinthius*, 5—5½ lines.

B. Abdomen red; apex of 1st and 2nd segments widely yellow; 1st, 3rd, and 4th generally black at the base (females).

Tarsi and tibiæ orange, apex of hinder brown.

14. *crispatorius*, 6—8 lines (*t*).

C. Basal or intermediate segments with pale spots (females).

a. 2nd and 3rd segments with pale lateral spots: apical segments pale marked.

* Femora black; the spots on 2nd and 3rd segments large and yellow; tarsi and tibiæ yellow, apex of hinder black.

4. *monitorius*, 6½—7 lines.

** Femora fulvous.

‡ Head moderately narrowed behind the eyes (spots on one or both segments sometimes wanting). - 12. *notatorius*, 7—9 lines (*a*).

‡‡ Head nearly straight behind the eyes. - 11. *atratorius*, 6½ lines.

b. Basal segment or segments with the apical margins white; or with white lateral spots—1st to 3rd, or 1st and 2nd, or 1st, segments marked.

Legs black; tibiæ broadly white-ringed.

Gastrocœli small; metathoracic areæ, three.

: Frontal orbits broadly reddish straw-coloured.

9. *margineguttatus*, 6 lines (*a*).

:: Frontal orbits broadly marked with white.

8. *oratorius*, 6—7½ lines (*a*).

c. The last four or five apical segments with greenish white lateral bands (also male). - - 17. *glaucatorius*, 5½—7½ lines.

A. 2nd and 3rd or 4th segments yellow, more or less marked with black; remaining segments with yellow margins (males).

a. Gastrocœli subobsolete.

* 2nd segment at the base, 3rd base and apex, yellow.

6. *infractorius*, 6—7 lines.

** 2nd and 3rd segments with large lateral spots.

4. *monitorius*, 6½—7 lines.

b. Gastrocœli distinct; tarsi and tibiæ yellowish, apex of hinder brown.

20. *occisorius*, 5½—8 lines (*h*, *s*, *a*).

B. 2nd to 4th segments yellow, or marked with black; apex of abdomen pale (males).

a. Metathorax armed with two acute spines. 5. *armatorius*, 6—8 lines.

b. Metathorax not so armed.

* Scutellum yellow.

‡ Gastrocœli slightly impressed. - 1. *palliatorius*, 6—8 lines (*h*, *a*).

‡‡ Gastrocœli very distinct. - - - 2. *trifasciatus*, 6—7½ lines.

** Scutellum white. - - - - *cerinthius*, 5—5½ lines.

C. 1st and 2nd, or 3rd, basal segments with white lateral spots or lines (sometimes wanting); 6th and 7th, or 7th alone, white marked (males).

Gastrocœli small; metathoracic areæ, 3.

‡ Antennæ black; tibiæ with a broad yellowish-white ring.
9. *margineguttatus*, 6—7 lines (*a*).
‡‡ Antennæ and tibiæ white-ringed. - 8. *oratorius*, 6—7½ lines (*a*).
D. Segments 1st to 4th yellow, base black or red; the remainder variously marked with yellow and black, or quite black (males).
14. *crispatorius*, 6—8 lines (*t*).

SECTION 6.—Scutellum pale; abdomen red and black; apex white or yellow.

A. 2nd and 3rd segments red, sometimes marked with black (females). Gastrocæli small.
a. Areæ of metathorax, three.
* Orbits of the eyes yellowish.
Tibiæ red or tawny-yellow, the last or last two, base and apex black.
3. *spoliator*, 6—8 lines (*l*, *a*).
** Orbits of eyes black, rarely inside partly red.
† Hinder femora red.
‡ Antennæ white-ringed, most frequently tricoloured.
19. *vadatorius*, 6—8½ lines.
‡‡ Antennæ not white-ringed; base yellowish, apex fuscous.
18. *pallidicornis*, 6 lines.
†† Hinder femora black.
§ 6th joint of flagellum of antennæ subquadrate.
21. *Gravenhorstii*, 6—8 lines.
§§ 2nd and 3rd joints of flagellum subquadrate; tibiæ and tarsi spined.
20. *occisorius*, 5½—8 lines.
b. Areæ of metathorax, five.
× Head behind the eyes not narrowed; greater part of legs nigro-piceous; antennæ sometimes with no white ring.
22. *negatorius*, 6—8½ lines (*s*, *a*).
× × Head behind the eyes obliquely narrowed; antennæ without white ring. - - - - 23. *uniguttatus*, 6—7 lines (*s*, *a*).
B. 1st to 3rd segments of abdomen red; petiole more or less black; 5th to 7th white-margined (females).
Gastrocæli large; metathoracic areæ, five; tibiæ red, apex of hind one black. - - - - 38. *strigatorius*, 5—6 lines (*a*).
C. 2nd segment of abdomen red; apex of 2nd to 7th with pale yellow margins (females).
Tibiæ and tarsi pale orange. - - 7. *amatorius*, 6½—8½ lines.
A. 2nd and 3rd segments red; sometimes marked with black (males). Gastrocæli small.
a. Metathoracic areæ, three.
* Hinder femora red.
† Antennæ black above; 4th to 7th segments widely margined with white at the apex. - - - - 19. *vadatorius*, 6 lines.
†† Antennæ yellowish; apex fuscous; 6th and 7th segments whitish.
18. *pallidicornis*, 6 lines.
** Hinder femora black.
‡ 4th to 7th segments with a white apical spot.
21. *Gravenhorstii*, 6—8 lines (*h*, *a*).

∷ 4th or 5th to 7th segments with the apical margins yellowish. 20. *occisorius*, 5½—8 lines (*h*, *s*, *a*).

b. Metathoracic areæ, five.

§ Head behind the eyes not narrowed. 22. *negatorius*, 6—8½ lines (*a*).

§§ Head behind the eyes obliquely narrowed. 23. *uniguttatus*, 6—7 lines (*l*, *a*).

B. 1st to 3rd segments red, and sometimes 4th more or less; petiole more or less black (males).

Tibiæ red, apex of hind one black. - 38. *strigatorius*, 5—6 lines.

SECTION 7.—Scutellum pale; abdomen red, or red and black.

A. Gastrocœli small (females).

a. Areæ of metathorax, five.

* Abdomen red; middle segments blackish at the base; hind femora red. - - - - 15. *equitatorius*, 5—6½ lines (*h*, *a*).

** 2nd and 3rd, and sometimes partly the 4th, segments red; incision of 2nd fuscous black; hind femora black. 16. *litigiosus*, 5½—7 lines (*t*, *a*).

b. Areæ of metathorax, three.

2nd and 3rd segments red; front legs partly red. 39. *alticola*, 6½—7½ lines.

B. Gastrocœli moderate, or rather large (females).

a. Segments 2nd to 7th, tibiæ and tarsi, red. 37. *fusorius*, 8—10 lines.

b. Abdomen chestnut, base black.

* Hind tibiæ red; apex and extreme base black. 33. *repentinus*, 5½—7 lines.

Note.—Gravenhorst described *I. melanocastanus* and *I. repentinus* as distinct species. Wesmael, in 'Tentamen,' united them, placing the latter as a *var.* of the former, but separated them in Bul. Ac. Brux., 1857, as Mr. Marshall has done in his list; but Holmgren has united them thus:—

Var. 1, male and female. Scutello nigro.
Ichneumon melanocastanus, Grav., I. E., i., 553.
Amblyteles melanocastanus, Wesm. Tent., 135.
Var. 2, male and female. Scutello toto vel apice albo.
Ichneumon repentinus, Grav., I. E., i., 467.

These two varieties are quoted by Wesmael in 'Tentamen,' with the same distinctive marks. From this it would appear one has a pale scutellum, the other has not.

** Hind tibiæ almost entirely black.

Metathoracic areæ *subquinque.* - 31. *mesocastanus*, 5—7 lines (*a*).

c. 2nd and 3rd segments red; the 4th sometimes marked with red; margins of red segments generally obscure.

† 2nd and 3rd segments entirely red.

: Areæ of metathorax, three; hind tibiæ reddish or brown; apex black. 30. *messorius*, 6—7 lines (*l*, *a*).

∷ Areæ of metathorax, indistinctly five; hind tibiæ not reddish at the base. - - - 31. *mesocastanus*, 5—7 lines (*a*).

†† Apical margins of 2nd and 3rd generally black (§), or segments more or less black, entirely so, or quite red (§§).

§ Postero-medial area of metathorax divided into three by two distinct lines; hind tibiæ almost entirely obscure.
29. *divisorius*, 7½—8½ lines (*l*).

§§ Postero-medial area of metathorax with two indistinct lines, or none at all; hind tibiæ towards the base whitish yellow or straw-coloured.
28. *fossorius*, 6—7½ lines (*l*, *a*).

A. Gastrocæli small (males).
2nd and 3rd segments fulvous-red, or 3rd segment more or less in the middle, or entirely black, or 2nd and 3rd fulvous; 2nd to 4th apical margins yellow. - 23. *uniguttatus*, 6—7 lines (*a*, *l*).

Note.—In Marshall's list *A. conspurcatus* is No. 24, which Wesmael says has a broader abdomen than *A. uniguttatus*, but is very like it. He further says, 'Amblypygi Europæi,' p. 40, that in the course of his experience of *A. uniguttatus* and *A. conspurcatus* he has noticed many specimens which are very much alike, and gives a list of three females and ten males, but will not say they all belong to the same species; still it is a remarkable coincidence that Holmgren, in his 'Ichneumonologia Suecica,' although he describes forty-three species, does not mention any one of these thirteen insects. This certainly seems to confirm Wesmael's opinion that they may be varieties of one species. Tischbein retains *A. conspurcatus* as a good species, with the remark, "not found here" (Birkenfeld).

B. Gastrocæli moderate (males).
a. Areæ of metathorax, three.
* Abdomen reddish; base black.
† Colour of abdomen red. - - - 37. *fusorius*, 8—10 lines.
†† Colour of abdomen chestnut. - - 33. *repentinus*, 5½—7 lines.
** 2nd and 3rd segments red, or marked with black; 4th sometimes partly red.
‡ Hind tibiæ white; apex and below the base black.
29. *divisorius*, 7½—8½ lines (*h*, *l*, *a*).
‡‡ Hind tibiæ red; apex black. - 30. *messorius*, 6—7 lines (*a*).
‡‡‡ Hind tibiæ towards the base more or less straw-coloured.
28. *fossorius*, 6—7½ lines (*l*, *a*).
b. Areæ of metathorax, indistinctly five.
5th segment sometimes castaneous; tibiæ semiannulated with white.
31. *mesocastanus*, 5—7 lines (*h*, *a*).

SECTION 8.—Scutellum black; abdomen red, or red and black.

A. Abdomen red, base black (females and males).
a. Gastrocæli small; areæ of metathorax, five; legs dark.
25. *castanopygus*, 5½—7 lines.
b. Gastrocæli rather large; areæ of metathorax, three; greater part of femora and tibiæ red. - 32. *melanocastanus*, 5½—7 lines (*s*, *l*).
B. Segments 2nd to 3rd or 4th red, or marked with black (males).
* Antennæ white-ringed; abdomen sometimes quite black.
26. *sputator*, 5½—7 lines (*l*, *a*).
** Antennæ not white-ringed; gastrocæli small.
3. *spoliator*, 6—8 lines (*t*, *a*, *l*).
C. Segments 2nd to 3rd or 4th red, or marked with black (females).
† Tibiæ black.

‡ Metathoracic spiracles linear-elongate; stigma of wings red.
23. *uniguttatus*, 5—6 lines (*s*, *a*).
‡‡ Metathoracic spiracles rather short; stigma fuscous.
35. *Panzeri*, 4½—6 lines (*l*, *a*).
†† Tibiæ red. - - - - - - 26. *sputator*, 6 lines.

THE COCOONS OF *HYDROPHILUS PICEUS* AND *HYDROBIUS FUSCIPES*.

By Abbott G. Laker.

In the summer of 1878 I had the opportunity of examining a good many cocoons of *Hydrophilus piceus*, and, as I have seen various and somewhat conflicting accounts given of these cocoons, my notes on the subject may possibly be of some interest to persons who have studied the habits of water insects.

The cocoons were taken from a pond in the south-east of London between June 9th and July 1st. They varied considerably in size and shape, but on the average were about 11½ lines long by 10¾ lines broad, and the height from the bottom to the tip of the spike was about 17 lines. The walls of these nests were composed of a substance very like whitey-brown paper, but the portion of the cocoon immediately under the spike was in each case closed simply by a loose downy material, which would not be impervious to water, and as this part was submerged, it is clear the enclosed eggs must be constantly moist. I have seen it stated these cocoons are water-tight, but this is not in accordance with my experience.

The interior of the nest contains a loose silky substance similar to that at the end immediately beneath the spike, and the eggs are arranged with great regularity, their ends resting on the bottom of the cocoon. The young larvæ, when mature, break through the silky substance mentioned above, but before they are ready to emerge they are capable of some degree of movement.

The cocoons, whilst the eggs are unhatched, are very buoyant, and, if allowed to float loose they are only submerged to about two-thirds of their depth. I have found them floating, and only surrounded with *Conferva*, but most of the specimens I have taken have been attached to the long grass growing in the water near the margin of the pond, or else attached to the under side of a floating aquatic leaf; and in the latter case the spike has always protruded beyond the edge of the leaf, but the cocoon itself has been hidden from above, but it would of course have been conspicuous from beneath the surface of the water.

It seems reasonable to suppose that the long spike with which these cocoons are furnished should perform some definite office, but I have been unable to determine what it is. The spike consists of a substance somewhat thicker and stronger than the rest of the cocoon, and is hollow throughout the greater part of its length, except that it is crossed and recrossed inside with a dark thread-like substance, thus somewhat resembling a horn stuffed with tow. The apex of the spike does not, however, appear to terminate in an orifice, but is closed.

It does not seem to me that this spike can serve as a balance to the cocoon, because the nests are usually attached to some kind of support; I may, however, mention that I cut off the spike from two of the cocoons, and in both these cases the eggs did not hatch; it is, however, possible this may have arisen from some other cause, although these particular cocoons appeared to be similar in every respect to others of which the eggs matured in due course. The cocoons from which the spikes were removed subsequently sank.

These nests are so constructed that when floating loose the spike retains its proper position uppermost, and even if the cocoon be held so that the spike is parallel with the water, and then suddenly released, it immediately rights itself; if, however, the spike be only partially submerged and then released, the cocoon turns bottom upwards.

The number of eggs contained in each nest is usually between 50 and 60; thus in four cocoons, of which I counted the larvæ when they emerged, the figures were respectively 53, 57, 56, and 57, or an average of 56. It will be observed how closely these figures approximate.

The egg-pouches made by *Hydrobius fuscipes* are very similar in substance and general appearance to those of *Hydrophilus piceus*, although far smaller, being about the size of a pea, flattened on one side, and are without any spike. I have found them very plentiful in April and May, attached to the under side of floating grass, their presence being indicated by the upper side of the grass leaves having small patches or streaks of white.

The spike noted in the cocoons of *H. piceus* is absent from those of *H. fuscipes*, its place being taken simply by the material of which the nest is composed, being continued from the under side of the grass leaf, round the edge, and then spread over the upper surface of the leaf. From their position these cocoons of *H. fuscipes* must be peculiarly liable to be submerged by the rising of the water through floods. I find, however, that the eggs in these pouches will hatch if kept entirely under water. Thus cocoons submerged on April 24th had, for the most part, hatched out by May 19th; there were, however, some of the nests which, on being opened out, were found to contain larvæ evidently alive, but not matured.

The larvæ appear to emerge, under ordinary circumstances, about ten to nineteen days after the cocoons are first made, but I expect the period varies according to the warmth of the water, and with other conditions.

I have, by opening various egg-pouches, had an opportunity of observing that the larvæ of *H. fuscipes* develop gradually, and are capable of motion some time before they are ready to emerge from the nest. The cocoons are also not water-tight, as there is always a considerable amount of moisture in the nests.

No doubt these cocoons serve as a protection to the larvæ, and as the individual eggs are not covered with any strong integument, and the process of development is gradual, the nest must act as a shelter to the young larvæ and preserve them from their enemies until they acquire sufficient activity to go in search of food.

4, Endwell Road, Brockley Rise, Brockley, Oct. 25, 1880.

PYRALIS LIENIGIALIS, Zell.: A *PYRALE* ADDED TO THE BRITISH FAUNA.

By W. Thompson.

It is with great pleasure I have to record the addition of a new *Pyrale* to the British fauna. In August, 1879, I captured a moth at light, which I put aside for a dark variety of *Pyralis farinalis* In August and September of last season I captured three others, also at light. Feeling convinced they were something new I sent a specimen to Mr. Barrett, who kindly wrote that they were the *Asopia Lienigialis* of Zeller. Mr. Bryan, another collector here, has also captured several specimens; in each case at light.

183, Stantonbury, Stony Stratford, Bucks,
March 5, 1881.

[*Pyralis Lienigialis* of Zeller is closely allied to *P. farinalis*, and will follow immediately after that species in our collections. Dr. Wocke places it in the genus *Asopia*, and separates it from the latter species only by *A. domesticalis*, a species not yet recorded as British. Dr. Wocke, in his Catalogue (1871), records our new addition only from Livonia and Finland. —Ed.]

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Silk-producing and other Exotic Bombyces.—Continuing my observations (Entom. xiii. 63) upon the open-air rearing of these insects in this country, I will begin by referring to *Attacus Luna*. I have been most successful in breeding this beautiful and delicately plumaged moth. On the 21st June last nine eggs hatched, resulting in five of the young larvæ attaining maturity and constructing cocoons between the 3rd and 13th of the following August. The larvæ were slieved to branches of walnut (*Juglans regia*), and protected from heavy rains by thin waterproof covering, and the cocoons were spun in the hollows which the larvæ had formed by ingeniously drawing together two or three leaves of the food-plant. The cocoons are equal in texture and size to those imported from America, the largest being nearly two inches in length, and one inch and a quarter in depth. The first imagines, a pair, emerged on the 5th September, measuring in expanse of wing, the male four inches and a half, and the female five inches, within half an inch of the maximum expanse of wing of the insect in its native state. The remainder, females, emerged on the 9th, and proved equally fine specimens. I noticed that the characteristic apple-green colour of the wings, as well as the purple-grey costal and thorax stripes, were of paler hues than that of imported specimens, but that the lunated spots on the fore, and the ocellated spots on the hinder, pair of wings were unusually clearly defined and brilliantly coloured. From the female, which emerged on the 5th September, 130 fertile eggs were obtained between the 8th and 14th of the same month, and more might have been obtained had not the moth been killed to preserve for the cabinet. These eggs show signs of not hatching until next spring or summer, contrary to the nature of the insect in its North American habitat, where it passes the winter in the pupal state, having completed the cycle of its active existence within the months of June, July, and August. This abnormal condition may, in a measure, arise from the mildness of our autumn compared with that of North America, where winter sets in with much abruptness and severity, and where consequently the gradations between heat and cold are not so perceptible as in this climate. *Attacus Selene.*—I have not been so fortunate in rearing this transcendently lovely moth, the eggs of which hatched too late in the season—5th August—to ensure success in the open air. Three larvæ, however, out of four hatched, approached full growth, and one of which commenced on 10th October to form a cocoon, which it was never destined to complete. These larvæ were fed and protected similarly to those of *A. Luna.* The caterpillar is very beautiful, as indicated in my previous notes.—G. J. Grapes; 2, Pownall Crescent, Colchester, Nov. 11, 1880.

Forcing Pupæ.—I have had lately rather extensive experience on this subject, and have come to a decided conclusion that where practicable it is infinitely preferable to allowing nature to take her own course, at least as regards obtaining fine specimens at a time when setting-boards are comparatively empty, and entomologists are not working so hard as in the general season. In October of last year I was fortunate enough to procure about 25 pupæ of *Papilio Machaon*, several of common species, as *Pieris napi*, *P. rapæ*, &c., besides odd numbers of *Smerinthus populi* and *S. ocellatus;* I also had 12 foreign pupæ of *P. Podalirius;* all these I put in a breeding-cage exposed to the outer atmosphere, where I left them for a time, as I have found it indispensable that they should be first exposed to the frost. If your readers remember, we had some cold weather in the commencement of December, which I allowed the pupæ to have the benefit of, and afterwards removed the whole batch to one of the hottest houses on the nursery. The following is a record of the times when the chief number of the imagines emerged:—On Christmas Day three *P. Podalirius* came out, and shortly afterwards specimens of *Pieris napi* and *P. rapæ;* on January 4th, 7th, 21st, and

February 5th, all the other *P. Podalirius* emerged; *P. Machaon* first made an appearance on January 28th, and I have since had nine or ten more. As I write this a superb specimen of that noble butterfly is drying itself in the cage. *S. populi* and *S. ocellatus* appeared a few days ago, and I also bred three foreign examples of *Pieris Daplidice* all in magnificent condition. I think that I have said enough to show that where possible it is an immense advantage to force those Lepidoptera which hybernate in the pupa state. I have an idea that those which pass the shortest time in that state are less liable to failure at the time of emergence than chrysalides which are compelled to run a gauntlet of evils, such as becoming too dry or the reverse, for nine and sometimes ten months. Out of about 30 specimens bred by me this winter, I have had but one failure, which was a *P. Podalirius*, and that was rather an accident, as I found the imago on its back in a little water which was at the bottom of the breeding-cage vainly endeavouring to rise. As it turned out afterwards, one pair of wings reached their proper size, the others never grew at all.—B. PRITCHARD; Frankwell Nursery, Shrewsbury, February 8, 1881.

LARVA OF CIDARIA FULVATA.—I fear Mr. Gervase F. Mathew has made a mistake in his description of the supposed larva of *Cidaria fulvata*, in the March number of the 'Entomologist' (Entom. xiv. 67). Probably by the time the April number is out some imagos will have appeared from the larvæ described, and, if so, I have no doubt they will prove to be not *C. fulvata*, but *Anticlea badiata*, the different varieties of the larva of which Mr. Mathew has described. Years ago I fell into the same mistake myself, but fortunately waited for the appearance of the imagos before publishing description. I had beaten out these larvæ very freely at the beginning of June from wild rose bushes here, about which in July *C. fulvata* was always plentiful. I had no doubt whatever of their being that species, and as such described them in my note-book. Nor did I scarcely suspect the error when no imagos appeared in my cages in July, nor until the following spring, when I reared from them a splendid series of *Anticlea badiata*. Several years after I found the larva of *C. fulvata*, and a description of it will be found in the 'Entomologist's Monthly Magazine' for May, 1880.—GEO. T. PORRITT; Highroyd House, Huddersfield, March 2, 1881.

Tenthredinidæ near York.—The following notes and captures of Tenthredinidæ have been made by me during the seasons 1879 and 1880. I am, however, indebted to Messrs. Fitch and Bridgman for naming them. They will, therefore, be pleased to accept my sincere thanks for their kindness in so doing. —*Trichiosoma betuleti*, Kl. This species is perhaps scarcely worth recording on account of its general abundance, but it is nevertheless an interesting species, being one of our largest sawflies. It abounds in the larva state on the hawthorn hedges around here; its large size and white appearance render it a conspicuous object. It is one, therefore, which may be easily found by the hymenopterist. If we beat the hedges in August or September into an inverted umbrella, we shall be readily repaid by an abundance of the larva. When disturbed it rolls itself up on the under side of a leaf, and will remain quietly concealed there until the object of its alarm has gone. After feeding for four or five weeks it then commences to construct a dwelling for its winter quarters. It does not, like the larvæ of the lepidopterous group, roam about for a considerable time in search of a place where it may safely rest, but, being full-fed, it sets to work there and then on the same twig on which it had been feeding, and makes a strong oval, leathery cocoon, something similar to the cocoon of *Eriogaster lanestris*. In this home it remains until the following May or June as a contracted larva. It then changes to a pupa a few weeks before its emergence as a perfect fly. *Crœsus septentrionalis*, L., is not, I believe, a species of general occurrence, though where it does occur it is found in some abundance, from its being a gregarious feeder. It has visited this locality during the years 1879 and 1880. I noticed it upon alder, birch, and hazel in 1879, stripping the bushes; in 1880 I noticed it only on birch, but in greater numbers than in the previous year. It takes firmly hold of its food-leaf with its prolegs, and if in anywise disturbed it throws up its posterior segments in self-defence. Its colour is pale green, with conspicuous black subdorsal spots. When full-fed it descends into the earth and spins a brown tough cocoon, and remains there until the following June. The colour of the perfect fly is black, with a broad bright red band on the abdomen. *C. latipes*, Hart.—A smaller species belonging to the same genus as the last. I met with a dozen larvæ on some birches in a hedgerow in 1879. It feeds much in the same way as the last, several larvæ together. These larvæ are brownish black, with the exception of the two last segments, which are yellowish. It has the same habit of throwing up its posterior segments when disturbed ; it also makes its cocoon in the earth. In the following year it is the first of the family to appear in the perfect state, being three weeks earlier than *C. septentrionalis.* The perfect fly is black, with a narrower band of red on the abdomen. *C. varus,* Hart. — This is another species of the same size as *C. septentrionalis.* I had the good fortune to meet with a number of larvæ in 1879, feeding upon some small alder trees in this neighbourhood ; they were of a darker green colour than *C. septentrionalis,* and without the black spots which are so prominent a feature in that species. Of our three species of *Crœsus,* all of which I have had the pleasure of rearing from larvæ, this is the last to appear in the perfect state. It began to emerge in July. *Cladius viminalis,* Fall.—I find the larvæ of this species under the leaves of the balsam and black poplars, seven or eight together. They rest during the day stretched along the under side of the leaf with all their heads together and their bodies touching one another. The colour of the larvæ is orange, with black heads, and some scattered black spots over the surface. When full-fed the larvæ made their cocoons between the gauze covering of the pot and the rim, indicating by this that the larvæ, in a state of nature, will make up in holes of the bark or dead branches which may be on the tree. *Tenthredo livida,* L., I have captured in its haunts ; it is a very lively insect. I find it amongst the tall rank herbage which grows luxuriantly along ditch sides. In such places *Heracleum sphondylium* and *Spiræa ulmaria* grow, and it is fond of settling on the leaves of these plants, or if disturbed it darts in among them, and is soon out of sight, whilst its quick movements make it very difficult to catch ; all the while its antennæ are vibrating quickly. Another distinct feature of this insect is, the tip of the antennæ are black, but the two joints preceding are white, and the remainder are black. *Tenthredo punctulata,* Kl., and *T. nassata,* L., are found in similar situations as the last. The former of these two is a quiet insect, and easily captured ; it will remain on the leaf or branch until you box it. It was common round here during 1880. *T. nassata* is a livelier insect. I took two examples in 1879, and might have taken more, but thought it was a common species. I did not see any during 1880, though I looked for it several times. The larva of *T. punctulata* is greyish green, with oblique grey stripes on the sides, which meet on the dorsal line. When full-fed it changes to a dull pink colour, enters the earth for its winter quarters without making any cocoon. *Tenthredo gibbosa*, Fall., *T. mesomela*, L., and *T. atra*, L., I have captured in this locality; of *T. gibbosa* I took two specimens, and one each of the others. *Emphytus cinctus*, L., I find amongst briars. I have also taken two examples of *Emphytus perla*, Kl., which, Mr. Bridgman says, is very rare. I do not remember where I got them, but think I beat the larvæ out with others, as I found them in my room. *Allantus arcuatus*, Forst., and *A. tricinctus*, Fab., I found on the umbels of *Heracleum sphondylium*, six specimens of the first and three of the second, in 1879. *Eriocampa ovata*, L., two examples amongst alders in June; *Pachyprotasis rapæ*, L., two examples; *Nematus capreæ*, Panz., *N. miliaris*, Panz., and *N. bilineatus*, Kl., bred five specimens of each, but did not take sufficient care to separate them so as to know their respective larvæ; *Hemichroa alni*, L., and *Selandria serva*, Fab., three specimens; also two specimens of what I take to be *Selandria flavescens*, Kl.; *Dolerus cenchris*, Hart., four specimens amongst nettles; *D. palustris*, Kl., and *D. gonager*, Fab., one each. *Monophadnus nigerrimus*, Kl., one example. *Athalia rosæ*, L., two; also three specimens of *Nematus myosotidis*, Fab. *Nematus viminalis*, L.—This interesting and possibly compound species lives, during its larval existence, in pea-shaped and round galls mainly on the under side of leaves of willows. I have met with it in this locality on two or three bushes, the two different shaped galls being on bushes very near each other. Whether the bushes on which both galls were found are one species of willow, or two distinct species, I cannot exactly say; only this appears to be certain, that the same insect is produced from both. The perfect insect is black, with the legs and generative organs dull yellow; the stigma is pale grey, with a black line on its inner side *Lyda flaviventris*, Retz. (= *clypeata*, Klug.)—I was fortunate in obtaining a specimen of this species during the summer of 1879 amongst young currant trees. It was seated on one of the lower leaves, and not having seen the species before, I speedily boxed it. It is unnecessary for me to say more about it, as there is an excellent translation of Vollenhoven's life-history at Entom xii., pp. 101—106. *Nematus ribesii* I omitted above on account of its commonness. It has, however, been abundant here during the past year. Various means have been adopted to get rid of this pest, such as quicklime, hellebore powder, &c., but of no avail; it is there again the following year. We have, however, two distinct species here feeding on gooseberries. The larva of *N. ribesii* is pale or whitish green, with numerous black spots over the surface; also larger than the other I have mentioned. The other is dark green, scarcely distinguishable from the dark green of the gooseberry leaf, and on close examination you can see small black spots on the surface. This species, during the past season, has been more destructive than *N. ribesii*, stripping whole rows of trees, and causing them to present a picture of leafless winter-like trees. The quantity of trees stripped by both species covered more than an acre of ground. — T. WILSON; Holgate, York, January 7, 1881.

ANCHOMENUS MARGINATUS, *L.*—I was rather surprised to see the note on *Anchomenus marginatus*, L., in the March number of the 'Entomologist' (Entom. xiv. 70), stating that it was usually considered exclusively a coast insect, especially as it was backed by such authorities. All my specimens of this insect came from the banks of the Trent, near Repton, in Derbyshire. I have also seen it on the banks of the Dove, near Burton-on-Trent; and last August I came across a specimen near Newark-on-Trent. Of course one does not expect to find the actual fore-shore beetles—like *Philonthus xantholoma*, *Cillenum laterale*, &c., which we, as a rule, actually find in shingle or under seaweed—in inland situations; but the habitat of the semi-coast beetles, if we may so call them,—the beetles that inhabit the sandhills, and the part of the shore beyond the reach of the tide,—must be taken with great reserve. I remember being much surprised at finding a *Broscus cephalotes* some eight or nine miles from the coast; but Dawson (Geod. Brit., p. 114) records this species from Woburn, in Bedfordshire. Compared with the fauna of large continents like Asia or America, our island may be considered as entirely consisting of coast, and therefore we must be very careful in speaking too strictly of coast or inland fauna. Botanists will tell us the same thing: many maritime plants are found flourishing at great distances from the sea, owing to deposits of salt and other circumstances; and there is no reason why the fauna should not be affected by these as well as the flora. A series of careful observations regarding the distribution and consequent variation of our indigenous insects would not only be very interesting, but extremely useful to science. The importance of such observations has been well shown by Mr. Wallace in his last book, 'Island Life.' Entomology is far too apt to degenerate into mere collecting; and any note, however trivial, that brings out a fact with regard to the structure, habits, or localities of insects, is far preferable to any note that simply records the capture of a rare species that has very probably been blown over from the Continent, interesting though these communications may often be.—W. W. FOWLER; Lincoln.

[I have myself always been accustomed to consider *Anchomenus marginatus* as a very common inland insect, having met with it frequently and in abundance.—J. A. P.]

STRANGALIA QUADRIFASCIATA AT WEST WICKHAM.—Last August I took this beetle, together with *S. armata*, at West Wickham. I send you this note as, besides the rarity of the insect, I believe it has not been noticed in the neighbourhood of London before.—A. SIDNEY OLLIFF; 36, Mornington Road, Regent's Park, March 7, 1881.

ECONOMY AND PARASITE OF A MYCETOPHILID.—Last May Mrs. Hutchinson sent me, from Herefordshire, a piece of a boletus, growing on a pear tree, with some small pupæ enclosed in a white silken web. In June I was successful in rearing from them a pair of *Lasiosoma* (*Sciophila*) *lutea*, Macq., and also a pair of its parasite, which Mr. Bridgman considers to be Holmgren's *Orthocentrus corrugator*.—C. W. DALE; Glanville's Wootton, Sherborne, Dorset.

ENTOMOLOGICAL NOMENCLATURE.—Mr. Briggs's remarks on the name "*Blancheata*" (Entom. xiv. 71) appear inexplicable, except on the supposition that he wished to name the species himself. The first discoverer of a species is clearly entitled to give it any new name he chooses, and Mr. Cooke (Entom. xiv. 43) is perfectly within his rights in naming the species *Blancheata*, and he is no more bound to concoct a name out of a dictionary than he is to follow the absurd example of Linné, and name it after mythological people who never existed, the more so as the greater majority of English entomologists do not understand Greek and Latin. In any other than the present case it might have been a questionable compliment to call a "pug" after a lady, but not in this, as all must admit.—CHARLES CLIFFORD; Corporation Street, Manchester, March 10, 1881.

REVIEWS.

Les parasites et les Maladies parasitaires. By P. MÉGNIN. Paris:
G. Masson. 1880.

THIS work treats of the parasitic diseases to which man and the domestic or wild animals are liable, and of those insects which produce them. The parasites of ourselves and our animals we all know are very numerous and very diverse; their attacks are often serious, and certainly their presence is at all times unpleasant. Though always specially noted by medical and veterinary practitioners, even generally by casual observers, it is astonishing how little is really known of them in this country. We welcomed the late Mr. Murray's 'Aptera' (Entom. x. 102) as a useful *résumé*, and much wanted manual of our despised lice, ticks, and mites; M. Mégnin's comprehensive volume we now heartily commend to the notice of all students, whether medical, veterinary, agricultural, or entomological. The present volume only treats of the parasitic *Articulata*, but it appears that a further work, treating of those lower in the scale and the cryptogams, is in preparation. M. Mégnin's first words define a parasite as a being living at the expense of other living beings. This will show the wide ground covered by this volume—the external and internal parasites of animals. The numerous parasitic Diptera, and the *Pulicidæ*, still retained in Kirby's order Aphaniptera; our well-known hemipteron (*Acanthia* or *Cimex*); the numerous *Pediculina* and *Mallophaga*; a single new Collembola, belonging to the *Poduridæ*, which our author tells us is a veritable stable-louse; and that abnormal coleopteron (*Platypsylla castoris*)—the Canadian beaver-parasite (figured, Entom. vii. 294)—are all fully treated of in both systematic and economic detail. Their history occupies 104 pages. The following 336 pages are devoted to the special families of the *Acaridæ*, amongst which M. Mégnin has long been known as one of the highest authorities. Particularly clear and comparative descriptions of the closely-allied species are given, and their metamorphoses, physiology, and "action nocive" are fully treated of; the nosography, etiology, diagnosis, prognosis, and treatment of the various parasitic diseases—in fact their special pathology is also fully set forth. The crustacean parasites of our marine animals are less exhaustively handled in the concluding sixteen pages,

Many pieces of information we should like to cull from this book, and we are sure they would be interesting and instructive to our readers; but, as we have said, it should be consulted by a variety of workers; as far as present information goes it will not be found wanting. Its value is greatly increased by the illustrations. There are sixty-three woodcuts, very nearly all from the author's beautiful drawings, and twenty-six plates, also drawn and lithographed by himself. We must, however, protest against the continental—especially French—method of publishing the plates and text in separate parts and wrappers; in the present instance the plates are nearly half an inch each way larger than the letterpress, which is demy octavo, so that it is quite impossible that the volume can be bound. The price of the work complete is about seventeen shillings.—E. A. F.

Biologie der Käfer Europas. By MATHIAS RUPERTSBERGER.
Linz a. d. Donau. 1880.

ENTOMOLOGICAL literature is now becoming so voluminous, and is so scattered, that judicious and concise cataloguing is one of the best works that can be performed in the interest of the working naturalist. Herr Rupertsberger has just completed such a guide in his 'Biologie der Käfer Europas.' This is an unpretentious volume of but just over 300 demy 8vo pages, but it will prove one of the greatest value to the working coleopterist, and more especially to the general field naturalist. When an insect belonging to any order is bred by the general entomologist, much valuable information is often lost to science from the mere fact o the great difficulty of ascertaining whether the observations made have been previously recorded. This remark is especially applicable to the Coleoptera, about whose economy so little is known in this country; many species are met with in the larval state and their life-history noted, but the uncertainty of whether the observations are new or not delays publication. Rupertsberger's valuable compilation will at once refer us to our present knowledge of the economy of any given species. After a short introduction and a list of the full titles of the periodical literature cited, we have in this work, firstly, the full record of the works and publications in which the biological literature appeared under the authors' names in alphabetical order; secondly, a systematic arrangement under the respective families, genera, and species; concluding with a catalogue of all known coleopterous larvæ, with the name of the describer, and the date of publication. There is also a good index to the genera. We have verified many of the numerous references and found but one slight error; the omissa also appear to be remarkably few, though doubtless there are some. Not only have our scientific publications been overhauled, but all our 'Gardener's Chronicle,' 'Royal Agricultural Society's Journal,' 'Loudon's Magazine' and 'Arboretum' references are included, as well as the numerous American observations on European species. Altogether nearly 700 authors are quoted, and their various publications are more than double that number. In the 'Larven-Catalog' English names are remarkably few and far between, showing that our discoveries in beetle biology have been comparatively very meagre; Mulsant, Perris, and Schioedte show remarkably well.

The 'Catalogue des Larves des Coléoptères,' by M. F. Chapuis et M. E. Candèze (Mém. de la Soc. royal des Sciences de Liége, viii., 341—653, 9 plain plates, 1853); Dr. K. Letzner's articles in the Breslau 'Zeitschrift für Entomologie' (vol. ix., pp. 1—17, Coleop., 1855); and Dr. Hagen's work in his invaluable 'Bibliotheca Entomologica,' Sach-register iii., 67 (vol. ii., pp. 440—1), with his further "Zusatz zu den von Chapuis und Candèze aufgeführten Larven von Coleopteren" in the Stettin 'Entomologische Zeitung' (vol. xxiv., pp. 298—309), were the bases on which Rupertsberger had to build, and the superstructure has proved itself well worthy of such foundations. He has built a suitable house, well fitted. May it be frequently used by all working entomologists, and then the pages of our own 'Zoological Record,' and of Carus' 'Zoologischer Anzeiger,' and his 'Zoologischer Jahresbericht' will contain more frequent biological references under "Coleoptera" than hitherto. This will soon necessitate new wings to Rupertsberger's compact house—a supplement to the then well known reference-book now under consideration.—E. A. F.

OBITUARY.

Walter Philip Weston.—By the early death of Mr. Walter Philip Weston (Entom. xiv. 72) a large number of the readers of the 'Entomologist' have lost a genial friend in one who was always willing to assist his brother naturalists either with information from the large store of knowledge he had accumulated or with specimens which he liberally distributed. Mr. Weston had from his childhood been attached to the study of Entomology; and although most of his attention was devoted to Lepidoptera, the other orders, particularly Coleoptera (of which he possessed a good collection), were not neglected. His favourite group of Lepidoptera was the Tortrices, and his collection of them is very complete. Whilst solving the problem of the identity of *Ephippiphora gallicolana* and *E. obscurana* (Entom. xi. 237) he made many interesting observations concerning the insects inhabiting oak-galls; and Mr. Bridgman named one of the new Ichneumons bred by him, *Cecidonomus Westoni*. As a practical collector Mr. Weston was most successful, but at the same time he endeavoured to attain scientific results from his work, and that he succeeded in doing so the pages of the 'Entomologist' bear ample testimony. Amongst the periodicals to which he contributed may be mentioned the 'Athenæum.' Had he lived there is no doubt but that science would have much benefited from his untiring energy and power of observation. In September, 1879, Mr. Weston married a daughter of Dr. Birch, keeper of oriental antiquities, British Museum, who survives to mourn his loss.—Ed.

Robert Hind.—Mr. Hind died at York, March 11th, 1881, aged sixty-one years. About quarter of a century ago Mr. Hind did much, in an unostentatious manner, to encourage and revive Entomology in Yorkshire. At his home in Gillygate, York, was established the York Entomological Society, which became a pleasant réunion of those interested in the subject. Chiefly on account of ill-health he has not latterly given much attention to collecting. He had, however, considerable success as a rearer of Micro-lepidoptera. It was he who first obtained in this country *Melissoblaptes Cephalonica*, a species which has rarely, if ever, been obtained since.—Ed.

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NOTES ON THE LEPIDOPTERA-RHOPALOCERA OF HUDSON'S BAY.

By J. Jenner Weir, F.L.S., F.Z.S.

Mr. Walton Haydon, a surgeon in the service of the Hudson's Bay Company, has been so kind as to send me the results of two years' entomological collecting in this very dreary region.

Mr. Haydon is stationed at Moose Factory, on an island at the south-western side of St. James' Bay, the most southern arm of Hudson's Bay, situated in long. 80° 56′, lat. 50° 20′, thus being about 3000 miles due west of London. The trees of the district are chiefly pine, birch, and willow, with currant and gooseberry bushes; the country is marshy. The winter is very long, lasting seven months, during five of which the thermometer does not rise above freezing, and sometimes sinking to −52° F. Mr. Haydon has sent me the observed mean temperature for eleven months of the year, according to Fahrenheit, viz.: January − 4° 2′; February − 6° 6′; March + 11° 8′; April + 24° 7′; May + 40° 6′; June + 51° 0′; July + 60° 3′; August + 58° 5′; October + 38° 0′; November + 25° 0′; December + 7° 8′. It will be seen that, although Moose is within a few minutes in the same latitude as London, the climate is very much colder, the winter longer, and the summer shorter.

Ordinary vegetables do not come to perfection; for instance, Mr. Haydon informs me that his peas grew to the height of ten feet, but produced no pods; and on July 16th, 1880, the potatoes were but four inches above the ground. At least thirty Indians had died of starvation during the winter of 1879-80.

In so dismal a country such creatures of the sun as butterflies could scarcely be expected to exist, but seventeen species have been transmitted, belonging to ten genera. Of the genera all but one are British; of the species three are British, eight are closely allied to British species, four have European allies, one alone presents an American type of an European genus, and one is of a purely American genus.

The British species are as follows, viz.:—

Vanessa Antiopa, Linn.—Differs only in the buff border being more irrorated with black dots than any British or European specimens I have seen. Appears in July, August, and September.

Pyrameis cardui, Linn.—This cosmopolitan insect presents not the slightest difference from the normal form. Appears from July to September.

Pyrameis Atalanta, Linn.—The only difference I can detect is that the white spots in the upper wings are slightly smaller than in British specimens. Captured in July and August.

The eight species more or less closely allied to British species are as follows, viz.:—

Pieris oleracea, Harr.—Closely resembles *P. napi*, but paler in colour, and the upper side of the wings spotless, as is the case in the male spring variety of the latter. Appears end of May, June, and July.

Argynnis Atlantis, Edwards.—A much darker insect than *A. Adippe*, one of its nearest British allies, with a broader dark band around the edges of the wings, and the under side of the lower wings with a chocolate ground colour.

Argynnis Myrina, Cram.—Very close to *A. Selene*, but, as in the last species, the under side of the wings is of a darker chocolate colour, and the silver spots are more distinct.

Vanessa Milberti, Godt.—Very closely allied to *V. urticæ*; it differs in being darker, without the row of blue spots near the edges of the wings, the two small spots on the upper wings of *V. urticæ*, are also absent; the central black spot on the costa joins that on the lower edge of the wing, thus forming a fascia, as is occasionally found in the latter species. The species flies early. The specimen sent was taken on May 14th, 1879.

Grapta Faunus, Edwards, and *Grapta gracilis*, Grote & Robinson.—Can only with difficulty be distinguished from each other, or from *Grapta C-Album*, Linn. The former species was captured in May; the latter in June, July, and August.

Lycæna Lucia, Kirby.—This species reminds me very much of our *L. argiolus*, and would appear also to be double-brooded, one of the specimens having been captured as early as June 13th, and another as late as September.

Colias Eurytheme, var.

Colias Keewaydin, Edwards.—Can scarcely be distinguished from our well-known *Colias Edusa*. The specimens sent me were taken in August and September.

The four species belonging to British genera, which have no near allies in these islands, but are represented on the Continent, are as follows, viz.:—

Argynnis Lapponica, Esp., and *A. Tarquinius*, Curt.—The Hudson's Bay form of the first species differs in no way from the European; and the second may probably be only a geographical variety, hardly differentiated sufficiently to be termed a distinct species. They appear in June.

Argynnis Bellona, Fabr.—In the shape of its upper wings, which are long and narrow, this is much further removed from the European species of the genus *Argynnis* than any of those above mentioned: it has a peculiar vinous-coloured under side to the secondary wings, and the silver spots are quite absent.

Papilio Glaucus, Linn., var. *Turnus*, Linn.—In Europe this fine species is represented by *P. Alexanor*, which it much resembles; it is also very like *P. Podalirius*. In July it is found commonly by Mr. Haydon; but the melanic variety, the true *P. Glaucus*, does not seem to occur.

The American type of an European genus is *Limenitis Arthemis*, Drury, var. *lamina*, Fab.; the only European species which this approaches is *L. populi*. This latter species appears to stand midway between such European species as *L. Sibylla*, Linn., *L. Camilla*, Wien. Verz., and the American form assumed by the genus on that Continent. The four specimens received very closely resemble in both sexes Edwards' figures of *L. lamina*, Fab., in the second volume of the 'Butterflies of North America.'

All the species dealt with I regard as Arctic or Sub-Arctic forms, standing on the same footing as the Arctic birds, and to which the zoological division into Palæarctic and Nearctic regions does not apply.

The purely American genus, *Phyciodes*, is not represented in any part of the Palæarctic zoological region; the highest development of the group has been obtained in the Neo-tropical zoological region, from which the species of the genus inhabiting North America have been probably derived.

The only species received from Hudson's Bay is *Phyciodes Tharos*, Drury. It appears during the months of July and August. The thirteen specimens sent do not differ very much in colour or markings, except that some are darker than others; and in two specimens there is a wavy line running through the black band at the lower edge of the upper side of the secondary wings. The insect is very plentiful in the district.

The collection, of which I have now given a description, small as it is, is not wanting in interest. It is surprising to contemplate the time which must have elapsed since the three identical with European species had a common ancestor, and yet the difference now existing is too slight to consider them even varieties of each other. A former connection with Europe by the Faröe Islands, Iceland, and Greenland, no doubt existed, and during one of the periods of mild Arctic climate the transmission of species from one continent to another was effected. We are so in the habit of calling this hemisphere the Old World, that it does not occur to us that it is just as likely that *Vanessa Antiopa* passed from America to Europe, as that the converse was the case.

To Mr. Walton Haydon my thanks are due for having furnished me with the material used in the preparation of these notes.

6, Haddo Villas, Blackheath, S.E.

BUTTERFLY HUNTING IN NATAL: ON THE COAST-LANDS.

By William D. Gooch, C.E.

(Continued from p. 66.)

The very close resemblance of these three insects, *Danais Echeria*, *Pseudacræa Tarquinia*, and *Acræa Aganice*, as they circled and swooped in the lazy luxury of intense sunlight, was most acutely watched by the veteran, who found difficulty in identifying the two latter insects from one another, although not so much so in separating *D. Echeria.* The latter has a Danaidine movement, every now and then, of its wings, a sort of flutter which the other two did not give, but the general tone of the colouring, the flight, and their association, lead even an educated eye astray. The congener of *P. Tarquinia, P. Boisduvalii,* perhaps the most richly-coloured insect of our coast, is equally deceptive, being closely allied superficially to *Acræa Zetes,* var. *Acara;* I have seen them on the wing together, and the most intense watching did not enable me to distinguish them. *P. Tarquinia* I always tell at once from *A. Aganice,* perhaps being more used to him, as he was always to be found at "my corner." We next add, on this spot, *Junonia Natalica, Terias Brigitta,* with the bright yellow, *Pieris Agathina,* two or three specimens showing the different ranges of yellow and orange in its colouring. *Atella Phalanta* visits its food-plant in plenty, and several deeply-marked specimens (it is the wet season brood) are secured. Although tempted to linger here by the ever-changing fauna, having a long stretch yet before us, we leave the crown of the hill and go into the unkempt fruit-garden, through which we are to gain the bush path.

The first step we make into the fallen orange leaves and fruit, which cover the ground, disturbs innumerable individuals of the very interesting moth, *Achæa Chameleon.* They are settled on the fallen and half-decayed fruit—guavas, oranges, lemons, sour-sops—which litter the ground, and are avidly sucking the juices that remain in it. The veteran who has not seen a similar phenomenon to the same extent before, commences a raid on them, and exclaims with delight at the diversity of each specimen from the previous. I remind him that butterflies are our object, and we must move on ; ten minutes, however, has given us to the two nets thirty picked specimens, which quite serve to indicate the *Chameleon* variety of forms of this moth. Its appearance in such abundance this season is very remarkakle, the more so that—although the larvæ must be large conspicuous grubs, and I have been collecting everywhere for the last three months—I have not seen a single specimen of it, although the imago is now out in myriads.

Amongst the moths, and holding their own as they best can, we capture, somewhat surfeited with their fruity repast, two females of *Papilio Merope*, one the *Cenea* type, the other the yellow one; *Charaxes Ethalion*, females also; *C. Citharon*, both sexes; and several *Crenis Natalensis*. These are all more attentive to the decaying guavas, perhaps on account of their stronger flavour, than to any other of the fallen fruits. In the sun also, round a *loquat* in bloom, we take, for the first time, although we have seen them before, the two gorgeous day-moths, *Glaucopis Formosa*, with its sheen of gold and silver and bands of purple and red, and *G. Madagascariensis*, with its rich black and crimson bands and marks. As we leave the corner of this old garden, and enter the thicket skirting the big bush which we are going to cross, we find several specimens of the larvæ of the clear-wing humming-bird moth, *Hemaris Hylas*, which are very variable; and on the food-plant, which has large green shiny leaves and clusters of red bell-shaped flowers, we watch a female depositing her eggs, singly, on the surface of the leaf, selecting always quite fresh opened young leaves on a central axil of the plant.

Eurytela Hiarbas, C. Cleodora, Acræa Natalica, Junonia Clelia, Philognoma Varanes, several *Pieridæ*, a damaged *P. Merope, A. Phalanta*, are all added here, as well as a few skippers, *Pamphila Mohopaani, P. mackenii, Nisoniades Djælælæ, Pyrgus vindex.*

The veteran, before entering the bush, quite bears me out in my penchant for this little bit of hunting ground, upon which, not an acre in extent, I have taken over one hundred varieties of butterflies in one season. Its aspect, compactness, and availability was borne in mind whenever he visited me afterwards; when missing I always sent for him to "my corner."

For the next half-mile our path is thence a track which I have cut with a bush-knife, rather tortuous, and very narrow, partly to get to the boles of the large iron-wood, mahogany, flat-crown, and fig trees, for sugaring purposes at night, and partly to work a way to the hill-top on the other side of the valley, which is the favourite haunt of *P. Menestheus* (*Ophidocephalus?*)

Pushing along, now and then barred by a fallen trunk or a thorny lliana, we reach an open glade of rank grass, and liliaceous plants and trees with mossy boughs, on which a few parasitic orchids are just over bloom; on the edge of this, being on the alert, the Satyrid, *Gnophodes Parmeno*, is marked down, and, after a very cautious approach and quick plunge, captured ere he can rise from the bed of fallen leaves on which he had settled, protected, to any but the best-trained eye, by his under wings of marvellous tracery of greys and browns. Here also the sweet little diaphanous *Pontia Alcesta* is taken, three specimens, slowly flitting through the complicated network of interlacing branches, and much easier to see than to obtain; and a little Satyrid, sporting pretty freely, is added, but one which we have already made acquaintance with on the edge of the bush, and on our path down to this glade. A large wood tiger moth also captured, although in bad condition, is interesting, because, as a female, it has a curved horny appendage at the tail which has puzzled me much to explain. I have bred the moth from larvæ taken in the same bush, but they were leaf-feeders, and so, if the appendage is an ovipositor, it is difficult to indicate its object; it is true I have never worked out the life-history, and, as the veteran suggests, it may pass the first weeks of its existence in the larval state under or in the bark of the food-plant.

Following the valley bottom downwards, although we have no great success in hunting, we have cool walking, and by the time we arrive at the high road, which we have to cross, we are cooled down, and have forgotten the intense blaze of the sunlight we have yet to experience.

The Natal bush is not very striking; the underscrub and thicket is so dense, that even when, as occurs now and then throughout it, a patch of really grand trees is found, you have a great difficulty in making out their size or beauty. Here and there, chiefly on the damper slopes, the undergrowth is less, and you are able to see fifty to one hundred yards, and appreciate the density of the growth and real size of the trees; and elsewhere some giant fig, battening on its victims, and still grasping the decayed remnants in its contorted stems, sweeps over a large area, and by its deadly shade seems to kill off the surrounding trees, to stand majestic amidst their destruction, and leave an open space below and round it.

The fig trees are full of holes, and in them a large Erebus moth, *Patula Macrops*, takes refuge, and, when poked out by a stick, flops out, like a bat, in a sulky, dodgy, and bewildering way, which renders him anything but an easy victim to the entomologist, the more so that, immediately upon his emergence, he dashes straight at your face on a tour of inspection. Bees also, and very large hornets, to say nothing of snakes, sometimes emerge from these holes instead of Erebus, and lend anything but a pleasing source of diversion to the operation.

The high road, when reached, although dusty, has one side of it lined by a labiate flower in full bloom, and here we first meet with the Hesperid, *Ismene Florestan*, and its var. *Valmaran!* They are charming insects to make acquaintance with, and are numerous. Poised at the flower-bells, with the bright white bar vibrating on the hind wing, if cautiously approached, they are not difficult of capture, and the veteran is soon pleasantly occupied, adding also *Callidryas Florella*, *Eronia Leda*, *E. Cleodora*, and a female *Anthocharis Ione*, who all come dipping along, with a hover from flower to flower, to sip and be off again. Whilst he is at work I stroll up to a bridge where a watercourse crosses the road, a favourite spot of *Papilio Pylades*, and, as he is there, I fetch up the veteran for a try; but *Pylades*, circling and settling, three of them, on the other side of the water, at an inconvenient height, are too well occupied flirting with each other to bestow any attention upon us. We try the long rod, but vote them "sour grapes," and return to our bush-path.

Leaving the road, a few steps carries us through a patch of castor-oil and dhol, the remnant of an old coolie garden, to a crossing lower down on the stream I have just mentioned, and, on a patch of damp sand in the sedgy current, sit two *Papilio Policenes*, drinking the moisture, whilst their delicate tails keep up a continuous quivering motion; with them are a school of "whites." In quietly approaching we put up the whites, which startle *Policenes*, and they are off before we can take them. On the margin of this stream, and at the edge of the old coolie ground, we find a sort of yellow laburnum shrub with several larvæ of the orange tiger moth, *Hypercompa Bellatrix*, on it, and in the course of our ascent of the opposite hill we take several specimens, freshly emerged, of the imago of that species. The next ten minutes is a scramble up a narrow path made by the Kafirs and Bush-buck conjointly, which in the very nature of things is not a happy hunting-ground; but it leads to the open glades of Kafir-Boom and Flat-crown, which are the special habitat of *Papilio Menestheus* and *P. Merope* in this country side, and to reach which has been the aim of our excursion in this direction.

Before commencing operations on *Menestheus*, we determine, as we have been long on the road,—it is past one,—to sit down and collect our forces, pin up and arrange captures, and finally see what is in the basket. Knowing that if the veteran once gets his eye on *Menestheus* he will be off, I select a nook where I never recollect to have seen him, and so manage to have a quiet quarter of an hour to refresh; undisturbed by any frantic dashes on the part of the veteran, who, as it is, can barely be restrained from plunging after the numerous *P. Merope* individuals that give us a call on their rambles. Whilst sitting there lunching I call my friend's attention to several flies, as he thinks them, but which I know to be "clear-wings," settled on the herbage about, and at times found abundantly in the glade. We box off several for closer inspection; I do not know their names, but they are not rarities.

(To be continued.)

LIFE-HISTORIES OF SAWFLIES,

Translated from the Dutch of the late DR. S. C. SNELLEN VAN VOLLENHOVEN.

BY J. W. MAY.

(Continued from p. 35.)

SELANDRIA CANDIDATA, Fall. (= *Repanda*, Kl.)

Imago: Fallen, 'Acta Holm,' 1807, 105, 45. Hartig, 'Blatt-und Holzwespen,' p. 279, No. 45. Thomson, 'Hymen, Scand., i., p. 230, No. 3.

The larva appears to be undescribed.

Selandria nigra, nitida, prothoracis limbo, squamulis et marginibus segmentorum abdominalium albis; maculis transversis in abdominis dorso cinereis, ore, orbitis, stigmate et pedum maxima parte subtestaceis. Long. 6 mm.

Several years ago Professor Westwood sent me from Oxford a yellow Tenthredo larva contained in a quill, describing it in a letter as the rascal which every year bored into his rose trees, adding that he had not hitherto been able to rear the insect; he asked me, of course, whether I was acquainted with the insect, to which query I was obliged to reply in the negative, but I undertook to investigate the matter, if possible; unfortunately, the larva I received was in such a sorry condition that there was no prospect of rearing it.

In my garden at Leyden I had, among other roses, a particularly fine French rose bush, one of the shoots of which I had observed to be bent and withered in the manner described to me; in fact, I should not be surprised if I had directed Professor Westwood's attention to it on the occasion of one of his visits, and that this may have led to his sending me the larva in question; however, it was so long ago that I cannot be certain on this point; anyhow, I examined my rose bush from time to time, and in June, 1865, I found, not only on the said rose bush, but also on others, several damaged shoots. I found one on the 1st of that month, and put it into spirits; on the 8th and 10th I put some of the twigs into some mould in a bottle, as I had found in the garden several twigs which had evidently been bored into, and from which the larvæ had disappeared, so that I concluded they changed to the pupa state in the ground, and not, like *Emphytus cinctus*, within the shoot.

Of one of these larvæ I made a drawing (fig. 3), and I at the same time made a sketch of the twig, as it was bent round, by which the habitat of the insect can be recognised (fig. 1*a*.) The shoot, after being distorted in this way, ceases to grow, and withers. The larva was moderately thick, and of a sordid yellow colour, somewhat clearer as to the anterior three segments, the alimentary canal appearing of a brownish colour, as seen through the skin. So far as I could make out, I observed twenty legs; the abdominal legs were, however, remarkably short, or else they were always too much drawn up into the skin. The head was smooth and globular, ochreous yellow in colour, the mandibles being ochre-brown; the palpi below the eyes were moderately long, the eyes themselves being inserted in round dark grey, almost black, spots.

The stigmata were very oblong, elliptic, and had grey borders. I failed to observe any hairs on any part of the body, and the claws of the thoracic legs were white, not brown, as is usually the case. At figure 2 I have represented this larva head downwards, as it attempts to conceal itself in a rose twig, which it had hollowed out, and which I tore open from the top, but I am entirely unacquainted with the earlier stages of its growth. I once, some years ago, received from Mr. Ver Loren a little yellow Tenthredo larva, which had been found in the rolled-up edge of a rose leaf; the agreement in colour and appearance, and also the tendency to live in concealment common to both, make me suppose that this little larva may represent a very early stage of the larger one.

When the larva is full grown it leaves its dwelling, and goes into the ground, where it forms a blunt oval cocoon of particles of sand and mould spun together; this takes place in the beginning of June, and in this cocoon the larva remains without change until the spring, somewhat bent, with the head downward; I found the larva in this state on opening one of the cocoons in the winter. In consequence of the larva remaining so long without change, and of my having so few examples, I had no opportunity of observing the pupa, and so I have been prevented from giving a figure of the insect in this state. I was afraid of opening the cocoons one after the other, as by so doing I should kill them, for it very seldom happens that the larva survives this treatment. I cannot account for my not having noticed the insect moving about in the glass, but the only imago which I succeeded in rearing was found dead, lying on the mould; it was a female of *Selandria candidata* of Fallen, Klug's *S. repanda*, which seems to be a rather scarce insect everywhere.

As my observations of this insect were so incomplete—I was unacquainted with the pupa and the male—I resolved to wait until I might have an opportunity of continuing my researches. I have, however, not been fortunate enough to meet with the larva again, and although for several years I made plans to go over to Noordwijk in the beginning of June to examine the roses in the botanical gardens at that place, I was only able to get there once, and the result was *nil*. I also made enquiry, through an acquaintance, of one of the large growers there, but with the same result. Under these circumstances, I determined not to wait any longer in the hope of becoming better acquainted with the life-history of this species, but to publish what I knew on the subject. *Selandria candidata* belongs to a small group which Thomson separates as a genus, under the name of *Pœcilosoma*, one of its principal characteristics being the variegated colouring of the abdomen, or, at all events, the occurrence of transverse marks or bands on that part of the body. For myself, I am opposed to founding divisions on such trivial characters, but I fear the docility of entomologists is such that this little genus will be accepted as so many others have been.

The head is short and broad, but slightly shining, the front and face with many folds and impressions, without hair. The eyes are brown, oval, and moderately protuberant. The antennæ are inserted low down on the face: they are but little longer than the thorax, and consist of nine joints, of which the third is the longest, and the ninth the narrowest. The trophi are white, except the base of the mandibles, which is grey; the labrum is of a paler white than the clypeus, which has a yellowish tint. The maxillæ and the broad posterior margin of the eyes are sordid white. The thorax is shining, and covered with very short hairs; the upper border of the prothorax and the tegulæ are white; the wings are transparent, iridescent, but a little clouded, the costa and the stigma being white with a tinge of brown. In the second submarginal cell is a horny spot; the anterior portion of the anal cell (*area lanceolata*) has a very oblique transverse nervure, the under wings have no middle cell. In my example the sides of the breast have on each side a small round white spot.

The abdomen, which is rather broad and flat, has the posterior margins of the segment very finely bordered with white, and, in addition, on the 2nd, 3rd, 4th, and 5th segments, on either side of the dorsum, bluish grey transverse bands interrupted in the middle, which may, I think, consist of a covering of very short fine hairs. The ovipositor protrudes but little.

The legs are of the ordinary form, rather slender than robust. The basis of the coxæ and the larger part of the femora are bronze-black; the apical half of the coxæ, the trochanters, the knees, the tibiæ, except the apical half, which is brown, and the basis of the tarsi are sordid white; the remaining portion of the tarsi is brown. The claws on the last joint are double. As I mentioned above, my only example was a female. I find by Thomson's description that in the male the marking of the head and thorax is less distinct, and the last abdominal segment is emarginate.

It appears from the above that this species is scarce with us, and especially so from the fact that it has not been enumerated in the catalogue of our indigenous Hymenoptera. It is also scarce in other places; Hartig found it once on *the willow*, and Thomson says rather scarce, adding, however, on *birch*, which I cannot explain.

Most probably this species has but one brood in the year.

INTRODUCTORY PAPERS ON *ICHNEUMONIDÆ.*

By John B. Bridgman and Edward A. Fitch.

No. II.—ICHNEUMONIDÆ (*continued*).

The compilation of a concise table of our species of *Amblyteles* is a very difficult matter. The variation in many species is even greater than in the genus *Ichneumon*, and we again have not only the varieties *inter se*, but the great resemblance one species often bears to another in colour and markings, and the often great disparity between the sexes, or rather supposed sexes, of a species, for in several instances it is doubtful whether they are correctly paired. *A. conspurcatus* is still without a female. Tischbein considers *A. palliatorius* and *A. spoliator* one species; his series comprised sixty-two males and eighteen females. Brischke follows Wesmael in thinking that *A. fossorius* and *A. divisorius* ought to be united, while, on the other hand, Tischbein thinks Wesmael's *A. inspector* is distinct. Brischke also separates *A. subcylindricus* (Marshall's Cat., p. 22, l. 14, "*cylindricus*" should be "*subcylindricus*") from *A. Gravenhorstii.* Some of our species vary greatly, but perhaps the most remarkable case is *A. uniguttatus.* Of this species Wesmael described sixteen well-marked varieties, and gave thirteen species, hitherto considered distinct, as probable synonyms (these included *conspurcatus*). Tischbein describes and tabulates forty varieties of *A. uniguttatus* male, which include eight Gravenhorstian species (Stettin Ent. Zeit., xxxvi., 274).

A gynandromorphous specimen of the common *A. armatorius*—better known by its Fabrician name of *fasciatorius*—is described by Wesmael (Bull. Ac. Brux. vi., pt. 2, p. 448); the head and antennæ are male (*armatorius*), and the abdomen is female (*quadrimaculatus*). Taschenberg has also described a gynandromorphous *Amblyteles* as *A. hermaphroditus* (Berl. Ent. Zeit. xiv., p. 425), which he says is near *A. camelinus* and *A. fossorius.* A specimen of *A. cerinthius*, with an eye almost obliterated, is described by Rev. T. A. Marshall (Ent. Mo. Mag. xiv. 278).

There are many good figures of *Amblyteles. A. mesocastanus* (*vespertinus*) and *A. Proteus* are figured by Christ. *A. Proteus* is also figured by Donovan (pl. 478), with one or two other doubtful species. Capital figures of *A. monitorius*, *armatorius* (*fasciatorius*), *infractorius*, *oratorius*, *notatorius* (*mediatorius*), *equitatorius*, *vadatorius* (*ambulatorius*), *occisorius* (*marginatorius*), *negatorius* (*ornatorius*), and *Panzeri* (*laboratorius*) are given by Panzer. Both Curtis and Stephens figure the rare *A. amatorius*. Wesmael figured the abdomens and hind tibiæ of *A. conspurcatus* with two varieties, and of his *A. novitius*, which is a variety of *A. margineguttatus*, in his plate illustrating the 'Ichneumones amblypygi Europæi' (Bull. Ac. Brux. Append. 1853—4, pl. ii., figs. 5—10). In Vollenhoven's 'Pinacographia' ten species of *Amblyteles* are figured on plates 7 and 27; of these *A. palliatorius*, *armatorius* (*fasciatorius*), *notatorius*, *vadatorius*, *occisorius*, *sputator*, and *repentinus* are British. Marshall removes *A. alticola* from the genus *Probolus*, Wesm., amongst the Platyuri, into *Amblyteles*; both sexes of this species are figured by Wesmael on his plate illustrating the 'Ichneumones platyuri Europæi' (figs. 1—3).

Mr. Marshall has followed Wesmael throughout in his arrangement of the species, and no references to Holmgren's 'Ichneumonologia Suecica' will be found, as probably the catalogue was compiled before the appearance of his second part (1871).

The economy of *Amblyteles* is similar to that of *Ichneumon*. The following is the list of hosts:—

1. palliatorius, *Gr.*	from	Smerinthus ocellatus; Marshall. Acherontia Atropos; Marshall.
4. monitorius, *Panz.*	,,	Smerinthus populi; Giraud. Perigrapha cincta*; Kriechbaumer.
5. armatorius, *Forst.*	,,	Vanessa Atalanta; Marshall. Saturnia carpini; Marshall. Xylophasia rurea; Brischke. Mamestra brassicæ; Brischke. Agrotis segetum; Marshall. Tryphæna pronuba; Brischke, Butler. Noctua xanthographa; Mosley. Phlogophora meticulosa; Taschenberg.
6. infractorius, *Panz.*	,,	Agrotis tritici (aquilina, Hub.); Rondani.
7. amatorius, *Mull.*	,,	Noctua; Giraud. Bred by S. L. Mosley (no host given).
8. oratorius, *Fabr.*	,,	Noctua festiva; Vollenhoven. Aplecta nebulosa; Bignell. Noctua; Brischke.
12. notatorius, *Fabr.*	,,	Tryphæna interjecta; Gir. T. orbona; Kriechb., Fitch.
14. crispatorius, *L.*	,,	Macaria liturata; Rond.
15. equitatorius, *Gr.*	,,	Trachea piniperda; Panzer.
17. glaucatorius, *Fabr.*	,,	Cucullia verbasci; Brischke. C. artemisiæ*; Brischke. Anarta myrtilli; Brischke.
18. pallidicornis, *Gr.*	,,	Noctua; Wesmael.

19. vadatorius, *Rossi*	from	Agrotis segetum; Brischke. Tryphæna pronuba; Voll.
20. occisorius, *Fabr.*	,,	Gortyna flavago; Eversmann, Rond.
21. Gravenhorstii, *Wesm.*	,,	Leucania vitellina; Kriechb. Gortyna flavago; Brischke. Cucullia Santonici*; Wullschleger.
? *var.* subcylindricus, *Gr.*	,,	Nonagria typhæ, N. sparganii, Gortyna flavago; Brischke.
22. negatorius, *Fabr.*	,,	Noctua brunnea; Gir.
23. uniguttatus, *Gr.*	,,	Abrostola urticæ or triplasia; Goosens (Gir.)
25. castanopygus, *Steph.*	,,	Dasypolia Templi; Newman.
27. castigator, *Fabr.*	,,	Vanessa Atalanta; Steph., Brischke. V. Io; Steph., Gir. Pyrameis cardui; Steph. Cleora viduaria; Speyer (Ratz.); Gortyna flavago; Marshall. Cucullia absynthii; Boie.
28. fossorius, *Gr.*	,,	Vanessa Antiopa; Ratz. Leucania lithargyria; Gir. Hadena adusta; Brischke.
29. divisorius, *Gr.*	,,	Nonagria sparganii; Hering (Ratz.). Hadena adusta; Brischke.
31. mesocastanus, *Gr.*	,,	Trichiura cratægi; Nees (Grav.). Aglossa pinguinalis ?; Voll.
32. melanocastanus, *Gr.*	,,	Tæniocampa cruda; Gir. Dianthœcia cucubali; Snellen (Voll.)
36. Proteus, *Christ.*	,,	Smerinthus populi; Voll. Sphinx pinastri; Ratz., Holmgren. Chœrocampa elpenor; Albin, Steph., Ratz., Sichel (Wesmael), Kawall, Brischke, Taschenberg, Holmgren, Reinhard, Marshall, Bignell, Weston, Fitch.
37. fusorius, *L.*	,,	Chœrocampa porcellus; B. M. Coll., Brischke. C. elpenor, Brischke. Callimorpha dominula; Boie.
38. strigatorius, *Gr.*	,,	Heliothis dipsacea; Gir.
39. alticola, *Gr.*	,,	Hadena adusta; Brischke. Abrostola triplasia; Gir.
cerinthius, *Gr.*	,,	Acherontia Atropos; Scott (Marshall).

HEPIOPELMUS, *Wesm.*

A. Black; scutellum, frontal orbits and two spots at the apex of the post-petiole, white; flagellum of antennæ, male, on one side from base to middle, white; female, white-ringed. *Var.* post-petiole quite black; also the antennæ of the male. - - - Ichn. 61. *leucostigmus*, 7 lines (*a*).

B. Scutellum, antennæ towards the middle, head, thorax and legs, marked with yellow; abdominal segments 1st and 2nd or 1st to 3rd with two yellow apical marks.
Ichn. 60. *variegatorius*, 6—7 lines.

Mr. Marshall retains these two species in the genus *Ichneumon* in his Catalogue, but Wesmael separated them, and later authors have considered this genus a good one; we have removed them, as did Marshall in his 1870 Catalogue. *H. variegatorius*, Panz. (= *flavoguttatus*, Gr.), is spoken of by Stephens as the most beautiful species of the genus (*Ichneumon*). Panzer figured the two sexes as distinct species (*variegatorius*, male; *notatorius*, female). Both this and *H. leucostigmus*, Gr., are well figured by Vollenhoven in 'Pinacographia' (pl. 27, figs. 5, 6). Last year Mr. Bignell bred a female *H. leucostigmus* from the cocoon of *Odonestis potatoria*.

ACOLOBUS, *Wesm.*

Scutellum and abdomen black; head pale-marked; 4th and 5th joints of hind tarsi red.
All the tibiæ red; antennæ white-ringed; (female) 3½ lines.
Front legs, the tibiæ, part of the femora and coxæ, white; (male) 4 lines. - - - - - 1. *albimanus*.

Apparently the only known British specimen of this species is the single male captured near Netley, and sent by the Rev. F. W. Hope to Gravenhorst, from which the original description was taken. Wesmael captured two females near Brussels in July. A capital coloured figure of the equally rare, but not British, *Acolobus sericeus*, Wesm., is given in the plate illustrating his 'Ichneumones amblypygi Europæi' (figs. 11, 12).

ENTOMOLOGICAL NOTES, CAPTURES, &c.

THE NEW FOREST AT EASTER.—After the long and severe past winter and the weeks of continued easterly winds, the balmy change in the weather which came over London during the week preceding Good Friday tempted many to risk the fickleness of an English spring by leaving this great city for the country. Among the crowded exodus there were those, of course, who went net in hand to seek for the early summer insects, but only to find the season a fortnight or more late, and most of the spring species still in good condition, even in the full freshness of recent emergence. Accompanied by Mr. E. G. Meek, I started on Thursday afternoon, April 14th, for Brockenhurst, New Forest. Our object was to capture *Eupithecia irriguata* and such other good things as might come in our way. After the long and tiresome journey from London, we arrived the inevitable three-quarters of an hour late—too late for any work that night. Friday was a charmingly sunny day, with nice soft westerly wind. By nine o'clock we had commenced our expedition into the Forest, choosing the road towards Lyndhurst, but turning off into Whiteley Wood, amongst the grand old oaks, which we thumped and thrashed with all the energy and vigour of renewed strength, after our long winter's rest. On comparing notes after three or four hours of steady work, we find our bag consists of the sorry array of some few *Eupithecia abbreviata*. We had seen *Diurnea fagella*, both males and females, in abundance and fine condition, as were *Tortricodes hyemana*. Continuing our rambles, we met Mr. Tate, of Lyndhurst, who told us of his captures during the month, which, with the exception of *Cymatophora ridens*, taken the day before for the first time, all his species were early spring moths. Strolling up to Bank, we returned through Hurst Hill, where we saw the first *Satyrus Ægeria*, evidently just out of pupa. *Gonepteryx rhamni*, *Vanessa Io*, and *V. polychloros* were also seen, the two former commonly. Our walk ended through Queen's Bower, which, from its sheltered position, was warm and sunny, but added no additional species. Saturday was chiefly occupied by a long drive through Lyndhurst, past Rufus Stone, Stoney Cross, Bolder Wood, &c. Near Stoney Cross we saw the site of one of the great Forest fires which have recently occurred in many parts of the district. This particular fire had burned from five to six miles in length, and a couple of miles in breadth, doing many thousands of pounds worth of damage amongst the fir and other plantations. On Saturday evening we examined the large oaks in Holland's Wood, but nothing occurred worth taking. On Sunday we went for a long ramble through Holland's Wood, Ramnor, New Plantation, Stubby Copse, Denny Wood, Woodfidley, thence over the railway to Frame Wood and Lady Cross, along the Beaulieu Road, some fifteen miles in all. In the evening the wind, which had been blowing strongly from the east all day, died away, and we took the opportunity to try again in Whiteley Wood for *E. irriguata*, and were each rewarded by one male specimen, evidently just out of pupa. After dark the bloom of the blackthorn was examined with some success, for we found most of the commoner *Tæniocampidæ*, including a very pretty red form of *T. gracilis*. *Aleucis pictaria* was there in small numbers, while *Hybernia progemmaria* seemed to be only just out of the pupa state. *Eupithecia pumilata* was flitting from flower to flower in numbers. We sought long and closely for *Dasycampa rubiginea*, which had been taken in Ramnor the week previously by Mr. C. Gulliver, but we saw nothing of it. On Monday our attention was given to *E. irriguata*, but without success, a long and brilliant series of *E. abbreviata*, however, to some extent compensating for our labour in a high east wind. On Tuesday the weather was so bitterly cold, with occasional showers of sleet, that no collecting could be done, so we walked over to Lymington, and went by boat to the Isle of Wight. Wednesday being no warmer, we returned to London. In addition to the species already named, we may mention having taken or seen during our visit *Boarmia crepuscularia* (common), *Anticlea badiata* and *A. derivata* (both in fine condition), *Cidaria miata*, *Xylocampa lithoriza*, *Xylina rhizolitha*, *Demas coryli*, &c. Small larvæ of *Cleora glabraria* were not uncommon on lichen-covered trees. Before concluding, I must refer to the Rose and Crown Hotel, where we stayed at Brockenhurst; every attention is paid to the comfort of the visitor, the accommodation being nearly equal to a West-end hotel, and the prices nearly as satisfactory.—JOHN T. CARRINGTON; Royal Aquarium, Westminster, S.W., April 23, 1881.

VANESSA ANTIOPA AT HEADLEY LANE.—While collecting in Headley Lane, on April 17th, in company with Mr. Jobson, of the Haggerston Entomological Society, I took a specimen of *Vanessa Antiopa* at rest on the trunk of a birch tree. It was sitting full in the sunshine, and was in either a half torpid or exhausted condition, for it allowed me to take it between my fingers without any attempt at escape. It is a female, and, for a hybernated specimen, in fair condition.—J. A. COOPER; 32, Bingfield Street, Barnsbury, N., April 19, 1881.

VANESSA ANTIOPA.—It will, perhaps, interest many of your readers to know that, while trout fishing in a pool among the hills in Brecknockshire, on Saturday, April 16th, I captured a specimen (no doubt a hybernated one) of the now rarely seen Camberwell Beauty (*Vanessa Antiopa*).—C. F. H. (25, Down Street, Piccadilly, W.); in 'Field.'

VITALITY OF ACHERONTIA ATROPOS.—I have to record a most extraordinary instance of vitality in the case of a fine *Acherontia Atropos*, which I captured last autumn. Upon my first taking it, it emitted a shrill cry, which continued without ceasing until I put it in my killing-box. This box is a close-fitting tin one, with a false bottom of perforated zinc. Being a large moth I dropped thirteen or fourteen drops of chloroform into the box, and kept it close between two and a half and three hours, at the expiration of which time, on opening the box, the chloroform was unpleasantly strong, and the moth to all appearance dead. I cut it open, eviscerated it, stuffed it with cotton-wool, and put it on the setting-board. To my astonishment, on inspecting it the following morning, it was quite lively, and, had the pin through the thorax not been a very strong one, would have liberated itself. I killed it by soaking it in benzoline, which, by-the-bye, I find the quickest and cheapest mode for all moths, and one doing them no damage.—ANNIE DOWS; Boston, Lincolnshire.

[We doubt whether the method of killing Lepidoptera recommended by our correspondent is the best; some of the older systems are less likely to damage the specimens,—the vapour of ammonia for instance.—ED.]

CHŒROCAMPA CELERIO IN DECEMBER.—On December 1st, 1880, I captured a specimen of *C. celerio* at Faversham. Not knowing what moth it was I did not attach much importance to it, until Mr. Waterhouse told me its name. I wish your readers to note the late season of capture of this rare species.—P. M. YEARSLEY; 1, St. Margaret's Terrace, Kilburn, March 20, 1881.

DESCRIPTION OF THE LARVA OF ATTACUS LUNA.—The prevailing colour of its body is light green, and the segments are adorned at regular intervals with tubercles of various sizes, from each of which spring clusters of minute bristles, in shape somewhat resembling spiked clubs; the tubercles on the 3rd and 4th segments are bright yellow, interspersed with black bristles or spines, and are situated on the top of conical protuberances, projections of the segments, which, being raised considerably above the dorsal tubercles, are most imposing and regal in appearance; the tubercles on the 11th and 12th segments are pale green with black spines, and similarly raised, one notably so in the centre of the latter segment, but less imposing in character; the tubercles on the intermediate segments are bright red and spinous; a light yellow lateral stripe, slashed at intervals with paler red, runs along either side of the body, above which are situated the peculiar oval-shaped red spiracles; there is a row of minute red tubercles, lessening in size as they approach the anal segments, above, and a row of larger red tubercles below each lateral stripe; the surface of the body, particularly the dorsal portion, is studded with slender tufts of fine silken white hairs, scarcely perceivable; the head and legs are slightly ferruginous, the prolegs light green, and the anal parts and anal claspers rich brown.—G. J. Grapes; 2, Pownall Crescent, Colchester, November 11, 1880.

Lepidoptera near Dover.—On Thursday, April 14th, I went to Dover, and returned on the following Wednesday. Thanks to the suggestion of Mr. Gray, I found a nice lot of the full-fed larvæ of *Acidalia promutata* feeding on plantain and other low plants. They may also be found on the dry patches of earth near the food-plants. *Tæniocampa leucographa* was taken at sallow bloom, and several were also taken last year by Mr. Davies. Acting on information kindly given to me by Mr. Sydney Webb, I found near Alkham the larvæ of *Psychoides verhuellella* feeding on the leaves of the hart's tongue fern (*Scolopendrium vulgare*). The larvæ make little cases generally on the under side of the leaves formed of the brown woolly spores, and in shape frequently just like the arrangement of the spores on the leaf. By hedgerows I took *Lobophora polycommata*, *Cidaria suffumata*, while the larvæ of *Callimorpha dominula* were in great numbers as usual.—Thos. Eedle; 40, Goldsmith Row, Hackney Road, London, E., April 22, 1881.

Aplecta occulta, &c., in Essex.—On August 13th, 1880, I took a fine specimen of *A. occulta*, at sugar, at Hazeleigh, near Maldon. I remember seeing a record in 'The Zoologist' (I think of the year 1843) of this species being taken by Mr. Doubleday at Epping, but believe that is an insect rarely taken in Essex. Another insect, which I may record as new to the former part of Essex, also visited my sugar on August 14th, namely, *Euperia fulvago*. I may also perhaps be allowed to record the occurrence of an insect, tolerably abundant and widely distributed, but which till last year I had never seen alive in the same district,—that most beautiful of our yellow underwings, *Triphæna fimbria*. Of this species I took two examples at Hazeleigh, August 10th and 18th, and several on August 10th at Woodham Ferris Hall Wood, where Mr. E. A. Fitch informs me he took the larva in the spring of the same year. Taking sugar as a whole, last season I was fairly successful, more especially so towards the latter part of the season, when *Cosmia diffinis* and *C. affinis* appeared in greater plenty than I remember to have seen them in any previous year. —[Rev.] GILBERT H. RAYNOR; The College, Ely, March 2, 1881.

CLOSTERA ANACHORETA.—In the year 1859, Dr. Knaggs announced that he had discovered eleven larvæ of this, till then, reputed British species. Ten pupæ resulted, and eggs were procured in due course. These, more or less, were distributed among various entomologists, and they having, in their turn, obtained eggs, the insect was bred for some years in such vast numbers as to become an absolute drug, and people ceased to keep up the brood any longer. Can any of the numerous readers of the 'Entomologist' inform me whether it has ever been taken since then in a "state of nature?" I observe in the 'Zoologist' for 1863, page 8694, a notice from Mr. Sidebotham that he had taken a larva at Folkestone very near the place where Dr. Knaggs made his discovery; and a similar notice from Mr. Meek, in the first volume, 1864, page 123, of the Ent. Mo. Mag. These instances are all I can discover, and they do not answer my question in the way I desire, as these larvæ were found in the same place as Dr. Knaggs's, and the "home breeding" had perhaps scarcely fallen through.—J. GREENE; Rostrevor, Clifton, Bristol.

COREMIA QUADRIFASCIARIA.—Seeing a notice of a new locality for this insect in the March 'Entomologist' (Entom. xiv. 70), I beg to add that I took five specimens, flying at dusk, in a lane near Nettlestead, Kent, about the middle of July last. Two of these specimens obliged me with some eggs, from which I have now a few larvæ feeding on the leaves of the white dead-nettle (*Lamium album*). I hope, therefore, that I may have the pleasure of breeding this species.—[Rev.] CHAS. F. THORNEWILL; The Soho, Burton-on-Trent, March 17, 1881.

STIGMONOTA SCOPARIANA BRED.—My hopes have been realised: this day I have bred three specimens of *S. scopariana* from the larvæ feeding in the flowers of *Genista tinctoria* last July. It is odd how extremely local some species are: I found these larvæ in one field only; I searched in vain other fields, but could not find any.—J. B. HODGKINSON; 15, Spring Bank, Preston, April 10, 1881.

DESCRIPTION OF THE LARVA OF PTEROPHORUS GALACTODACTYLUS.—During June last I bred a nice series of this very pretty "Plume," from liberal supplies of larvæ sent me by Messrs. W. H. Grigg, of Bristol, and F. D. Wheeler, of Norwich. From the two lots of larvæ it would appear they attain full growth sooner or later in different localities, for the larvæ from Bristol were spinning up when received in the first week in May, and were all pupæ when the still smaller larvæ arrived from Norwich at quite the end of the month. They were feeding on the under side of the leaves of the burdock, eating through and quite riddling the large leaves. Length about three-eighths of an inch, and of moderate bulk in proportion; the head has the lobes rounded and polished, and is considerably narrower than the 2nd segment; body rounded at the subdorsal region, slightly flattened dorsally, and still more flattened ventrally; it is attenuated posteriorly, and also from the 3rd segment to the head; tubercles large and prominent, each of them emitting a tuft of moderately long hairs; skin very slightly roughened, and the segmental divisions well defined. Ground colour of the head and body uniformly pale pea-green, the mandibles brown; two rather distinct grey lines extend through the dorsal region, enclosing between them the less distinct, narrow, grey, medio-dorsal line; there is an indistinct row of grey spots substituting the subdorsal line, and the spiracular ridge is also greenish grey; hairs grey, those from the side tubercles stand out horizontally and are slightly curved, giving a remote resemblance to the larva of *Acronycta leporina;* ventral surface uniformly of the pale green of the dorsal area. When full-fed the larva spins a patch of silk on the under side of the leaf, or on the stem of the burdock, or on any convenient object near, and in a few days changes to a pupa. This, though laid flat, is attached to the silk by the anal hooks only, there being no silken belt round the body. Like others in the genus it is somewhat similar to that of a butterfly, or an *Ephyra;* is about five-eighths of an inch long, and of average proportions; thorax and head rounded above, flattened beneath; head bluntly rounded off; the leg- and wing-cases extend half-way down, but are detached from the abdomen. Ground colour bright green; two distinct white stripes extend from the thorax to the tip of the abdomen, and outside these stripes, on each side of the first two abdominal segments, are two conspicuous black spots, one on each side, and there is a faint indication of similar spots also on the other segments: as in the larva each tubercle emits a tuft of grey hairs. —G. T. Porritt; Highroyd House, Huddersfield, April 5, 1881.

Prionocyphon serricornis in Kent.—Last year (in August or September) I took, in Kent, a small orange beetle, which I in vain tried to set properly, and after breaking several of its legs I was about to throw it away, but on second thoughts I carded it as it was. Mr. Waterhouse has now recognised it as *Prionocyphon serricornis*, one of the rarest of our Coleoptera. As oak, nut, birch, and blackberry are numerous in the locality, it probably was beaten from one of these; most likely from one of the two first named.—E. A. BRUNETTI; 15, Low. Grosvenor Pl., April 18, 1881.

[The insect is not a common one, but by no means so rare as the captor seems to think. I am pretty sure that it exists in most of the better collections. I have myself by promiscuous sweeping taken some six or eight examples of it, and find specimens in my cabinet ticketed as Darenth (3), Birch Wood, Littlington (Cambridgeshire), and dated between June and August. It is very fragile, and requires to be set at once.—J. A. P.]

SCIENTIFIC NOMENCLATURE.—I need not reply to Mr. Clifford's imputation, particularly as, after our recent experiences, I am sceptical about our northern *Eupitheciæ*, and do not expect that the claims of *E. Blancheata* to specific distinction will prove less ephemeral than usual. But as regards his sweeping claim for the absolute right of a discoverer of a new species to name it as he likes—even, it might be, against the commonest rules of sense, grammar, and science—I must protest, and I utterly deny the existence of any such right. A right to give a name I admit, but the name must be in accordance with the recognised rules of scientific nomenclature. There are two universally accepted main rules as to the specific name. The first is that the name should be Latin, or at least Latinised; and hard as this rule may be upon the "little Latin and less Greek" which Mr. Clifford claims for the majority of the entomologists whom he knows, it is certainly a rule framed in the interests of science. In these wretched "collector's names" we often find a mere senseless agglomeration of letters containing a weak hash of two languages, with a flavouring of a third. The second main rule is that the name should refer to the insect's appearance or habits in one of its stages, or to its food-plant, or to the locality in which it occurs. When, as is occasionally done, this latter rule is infringed by naming a species after a person, the person so honoured should be some well-known leader in the science, and not a mere local celebrity utterly unknown beyond a small circle of admiring friends. Mr. Cooke's attempt at nomenclature, however, is a new departure, for he absolutely concocts a specific name out of a lady's christian name,—a bold and novel proceeding, certainly, but one by which I utterly decline to be bound. If Mr. Clifford is an admirer of the bad example afforded by such names, "Copperhead," "Knownothing," "Werang," "Figulilella," "Zakharsckevskyi," "Stscheglovii," and "Stschukini," and chooses to tax his inventive powers by creating such names as "Smithii," "Brownii," "Jonesii," and "Robinsoni," he is welcome to do so as far as his own collection is concerned; but I object to the imaginary right which he claims of compelling others to do the same, and thereby afford a fresh example of the truth of the old proverb.—C. A. Briggs; 55, Lincoln's Inn Fields, April 20, 1881.

REVIEW.

Insect Hunter's Companion. By the Rev. Joseph Greene, M.A. Third Edition. Revised and extended by A. B. Farn. London: W. Swan Sonnenschein and Allen.

If we remember correctly, in noticing this work 'Punch' recently said that visitors to the seaside could not have a better companion, but perhaps our venerable caricaturist mistook the actual meaning of the title of this little book. The former editions were so well known to our readers that it is quite unnecessary to give a detailed account of this handy little guide. In revising it, Mr. Farn has carefully brought the Rev. Joseph Greene's work up to the present state of knowledge of the art of collecting, having added much to the original work. A new feature is the addition of a number of woodcuts and figures, which will greatly assist the beginner; amongst these we may note the Bignell Tray, and a full set of apparatus necessary for the preservation of lepidopterous and other larvæ. Several modes of collecting are fully described which were little used when the former editions were published; notably, we may mention "Light." In conclusion, Mr. Farn has added some practical remarks upon collecting Micro-lepidoptera, which will be found useful to those who have not already paid attention to this branch of Natural History. Whether we address the schoolboy collector, or the more learned Entomologist, we can safely say that every one who reads this book will learn something, and find in it some suggestion which will be useful either in the field or the study.—[Ed.]

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ON SILK-PRODUCING BOMBYCES.

By Alfred Wailly.

(Membre-Lauréat de la Société d'Acclimatation de France.

During the year 1880 the cold weather, which lasted till about the end of July, affected, as it did in 1879, most exotic Lepidoptera, and prevented the reproduction of several species. Ova obtained at a low temperature, even when the pairings of the moths have been of long duration, are partly and sometimes totally unfertile. No pairings could be obtained of *Attacus Mylitta, A. Aurota, Samia Gloveri, Actias Selene,* and some other species. However, the splendid weather we had during the month of August and part of September would have allowed of the successful rearing in the open air of the species obtained, had I been able to protect them from the sparrows. I had on trees in my garden *Attacus Pyri, A. Pernyi, Samia Cecropia, S. Promethea, S. Cynthia, Telea Polyphemus, and Actias Luna.* All these thrived splendidly. *Cynthia* (as usual) and *Promethea,* a very closely allied species, were not touched by the birds, but all the others were destroyed when in third or fourth stage, in all about 400 larvæ.

My greatest success, I ought rather to say my only success, was with *Actias Luna,* of which species I obtained twelve or thirteen pairings with the cocoons I had received from America. With about one hundred larvæ I obtained more than eighty cocoons. The larvæ were reared on walnut in large cages, and even under glasses, which shows that the species is easy to rear. The larva of *A. Luna* differs considerably from that of *A. Selene* in the first two stages. *A. Selene* in first stage is of a dark reddish colour, with a broad black band in the middle of the body;

in the second stage it is of a lighter red, without the black band; in the other three stages it is green, with bright yellow tubercles. *A. Luna* is green in all its stages, the colour in first stage being very light green, almost white; the tubercles are of various shades of red or crimson. The *A. Luna* moths emerged from the beginning till about the end of June. The larva feeds well on walnut, hazel, and other trees.

Of *Samia Ceanothi*, from California, I obtained two pairings, but was not successful with the rearing of the larvæ. One of my German correspondents, however, succeeded, with only six eggs of this species, in obtaining three cocoons, which I consider a very great success. *S. Ceanothi*, in the perfect state, is a little smaller than *S. Gloveri*, and of uniform colour on the four wings; rich brown, with white bands and markings. *S. Gloveri* seems to partake of *Ceanothi* and *Cecropia*, but the cocoon of *Ceanothi* is entirely different from those of *Gloveri* and *Cecropia*; it is pear-shaped, and very pointed at the open end. The interior cocoon, of a brown colour, is small compared to the exterior envelope, which is iron-grey. Most of the *Ceanothi* larvæ I obtained died in the first two stages; a few reached the third stage, and were thus:—Back of body sky-blue; sides greenish yellow; tubercles golden yellow all along the back, and on the sides blue; head green.

Ceanothi-Gloveri hybrid.—Many pairings took place among different species, the ova being in all cases unfertile, excepting that of a cross between female *Ceanothi* with *Gloveri*, which lasted from the evening of the 20th to that of the 21st May, 1880. Over two hundred larvæ hatched from the 15th to the 21st June. Unfortunately they all died in first or second stage, a few reaching the third stage. In the third stage the larvæ were thus:—Back bluish; sides yellow; tubercles on back orange-red; tubercles on sides blue; head yellow. One of my American correspondents succeeded in obtaining cocoons of a hybrid between *Ceanothi* and *Cecropia*.

In 1880 the cocoons of *Gloveri* were very bad, and I obtained from my large stock a swarm of cripples, and many pupæ were dead. This year (1881), on the contrary, the *Gloveri* cocoons are both larger and heavier, and the stock I have promises to give chances of success for the rearing of this fine species in England and on the Continent. These cocoons, in 1880 and 1881, were collected at some distance from Salt Lake City, Utah; they are found on narrow-leaved willows growing in or near swamps.

The reverse has taken place with respect to *Ceanothi* cocoons from California, which in 1880 were fine and large, while in 1881 hardly any cocoons could be collected, and these only about half the size of the *Ceanothi* cocoons of the year 1880. I regret to say I have not received any *Ceanothi* cocoons this year, at least up to the present time.

In 1880, for the first time, I attempted the rearing of *Attacus Atlas* from ova which were sent to me by a French correspondent about the middle of August. The season being then too far advanced to give me any chance of success for rearing the larvæ, I only kept twelve ova to see what would come of them. Of the twelve ova, five larvæ hatched on the 22nd August; three died in the first or second stage, but two lived on the barberry, under a bell-glass and in splendid condition, up to the 6th November, when I sent them to a correspondent for preservation. The larvæ had remained thirty-two days in the fifth stage, which is the last but one. From this experiment, I think *Attacus Atlas* is a species easy to rear.

Attacus Aurota.—In 1880 I for the first time received live cocoons of this splendid species (the South American Atlas) from French Guiana. The moths emerged in splendid condition from the 12th June to the 3rd July, but no pairings could be obtained, the weather being unusually cold, as it has been observed. Moths and specimen cocoons of *Attacus Aurota* may be seen in the Insectorium of the Westminster Aquarium, where they may be compared with *Attacus Atlas.*

Attacus Aurota in French Guiana has six generations in the year; the larvæ form their cocoons twenty days after their hatching. Another species found in French Guiana, *Attacus Hesperus,* is only fifteen days from the hatching of the larva to the formation of the cocoon. *Attacus Aurota* and *Hesperus,* both very brilliant species as perfect insects, produce cocoons of good silk, but they are, like *Atlas*, *Cynthia,* and many other species, open at one end. I hope to receive cocoons of these two species for this season, and if so, I hope also to have some success with the pairings. The difficulties to reproduce exotic species in this country are very great and various. Sometimes the moths emerge too late, sometimes too early, as it has been the case this season with *Attacus Roylei*, the Himalaya oak silkworm, and *Actias Selene*. On the 4th and 5th March, 1881, two males and one female of *Attacus Roylei* emerged, and to my great surprise a pairing took place; the greater part of the ova obtained shrunk, but a good number show now (4th April) but a very slight depression, and may be good. Several *Selene* moths also emerged from the middle of March to the present moment (4th April).

A fuller report on the species bred in 1880 will be found in the 'Journal of the Society of Arts,' February 25th and March 4th, 1881. It contains an article on the collecting and rearing of larvæ, and also on the best plan to adopt for sending living cocoons and pupæ from distant countries to England. Articles on the same subject appeared in the 'North China Herald,' November 25th; the 'Madras Athenæum' and 'Daily News,' December 4th, 1880; the 'Times of India' (Bombay), the 'Indian Agriculturist,' and other papers.

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BUTTERFLY HUNTING IN NATAL: ON THE COAST-LANDS.

By William D. Gooch, C.E.

(Continued from p. 105.)

After our frugal lunch, our little party marshalled, we enter within a few paces from where we have rested, the long open glade on the summit of the hill, chiefly made up of Kaffir-Boom trees, which is the special haunt of *Ophidicephalus*, and we have barely arrived, ere himself in person interviews us. Taken somewhat by surprise, the veteran's stroke is lost, and I make none, or I should have inevitably captured his hat instead of *Ophidicephalus*, as it was the most prominent object to hand.

A minute or two later we are stationed in a narrow part of the glade, well shaded from the fierceness of the sun, and with a tunnel formed in the bosky depths, through which the coursing insects charge headlong in pursuing their flight along the glade, which is clearly continued, although much constricted.

Mark! cry I, and our veteran in eagerness strikes at the lounging male, which approaches not apparently at a great pace, but in a most deceptive way, his tails undulating and swaying as the insect swings forward, travelling, however, as a matter of fact very rapidly. The keen eye and quick wrist of the veteran is too much for the victim, despite his doubling dodge; but less the tails, which have been spoilt by the too eager stroke of the veteran, *Ophidicephalus* is, however, safe, and soon impaled: the specimen is not a very good one, and so the loss of the tails is not very lamentable.

A quarter of an hour more brings us good luck; we take between us eight fair specimens. I then leave the veteran, whilst I look for the larvæ of two or three of the big *Saturnia*, which occur on the Kaffir-Boom, as also of *Cyllo Leda*, which feeds on the coarse-ribbed bush-grass forming the undergrowth about here. I am more successful in my hunt than has been the veteran, who on my return has taken no prizes, not having seen a single specimen; but he has added *P. Leonidas*, several *Danais ochlea*, and taken a lovely moth, closely allied to our genus *Catocala*, but much larger, and with a sort of silvery sheen over the scales of the fore wings. I think it is an *Ophideres.* The specimen is the only one like it I have ever seen, and differs by the black emargination of the under wings on the orange-ground from the ordinary type.

Having followed the glade along the hill-top, we arrive without any great captures at an old Kaffir garden. Here are *Acræidæ* and *Pieridæ* in plenty. We hence strike the Kaffir path leading down to the river, and have barely left the clearing when a day *Saturnia*, *Aphelia Appolinaris*, flutters within the veteran's reach, and is bagged. Several others follow, and we find ourselves in a "school" of them, evidently just emerged from the pupa, and swooping about in a very inexperienced way. Twelve or fourteen specimens are collected very rapidly, three of which are tawny yellow, with the veinings in a violaceous grey; this is a very usual form of variety. Every brood I have reared has yielded a definite number of the tawny variety; at first I considered it a sexual difference, but I found on closer examination they were of both sexes. The moth is very delicate and transparent winged when seen in the sunlight. The larva also is conspicuous and handsome, with a slight anal horn, almost approximating Sphinx in type.

A tortuous path, in which several Geometers and a "Blue" are taken, leads us abruptly to the open face of a grassy and somewhat precipitous hill-side covered with *Mimosa* scrub, the change of locality altering the character of the flora throughout; before entering the greenland, however, two "Mother-o'-Pearls" fall to our lot on the edge of the bush, and some insignificant *Hesperidæ*.

We descend the hill pretty rapidly, and on our way take for the first time *Nymphalis Candiope*. We both of us mistook it for *Philognoma Varanes* till netted,—a very common error,—although he is really still more like *N. Pelias* than the other. A small ravine crossed, and a patch of scattered bush is examined, where *Neptis Goochii* and *N. Saclava* are both taken; the former on a *Mimosa* spray in the bush, the latter on an ironwood. Here also we find two specimens settled in the shade of *Argyris Latonaria*, a white geometer, with jewelled spots on its wings of great beauty; an insect that is abundant in Natal, and is common also in India.

From the bit of bush we emerge, somewhat hot, on a clearing, now being hoed for sugar-cane, but originally planted in coffee, an evidence of the vicious taste of the Longicorn, *Leuconota Capa*, which has cost the colony many thousands of pounds by its depredations in the coffee trees, which it attacks in preference to its own bush-food. I suppose in the gross, without exaggeration, at least £100,000 has been sunk in coffee planting in Natal, and has all been eaten up by this insect.

On the edge of the clearing we take *N. Brutus* again, sucking gum on the sunny side of *Mimosa:* as the branch is low and not much protected by thorns, we take him easily. I think, too, about this time—it is nearly 3 p.m.—the insects which have been sipping freely are stupid, if not tipsy, and do not seem so active or quick as earlier in the day. The lower edge, in the rank weeds of the clearing opening out on to grass land, yields *Anthocaris Ione*, several *Colias Electra*, two or three *Pieridæ*, and *Ismene Valmaran*, on Labiate flowers. Crossing the grass land we get Geometers, put up as we pass, and also take *Hypanis Ilithyia*, which is present in both varieties, in great numbers. A big *Libellula Myrmeleon* flops hurriedly across us and is captured, very beautiful of colouring and marking; and another is missed and marked down, but we do not follow it.

At the bottom of the grass we come into an avenue of *Bois-Noirs*, leading up to the neighbouring planter's house. This avenue is an unfailing locality for Nymphalidæ; and as we follow it along to the River (Umblanga), which we are now approaching, *Nymphalis Ethalion, N. Cithæron, N. Neanthes*, and *N. Zoolina*, are all victimised in a couple of hundred yards.

When we reach the river, instead of crossing it by the Drift we follow a path by its side, till we reach some precipitous rocks, with rather rough walking and sedgy margin with patches of nettles. A little examination shows us *Diadema Dubius* and *Anthedon*, and after several trials we get the latter. As, however, the sun is low and off most of this face, we push on, and the veteran makes up his mind to try a quiet morning by himself along this bit of country, now that he knows his way about. Along this cliffy scramble for a quarter of a mile and we emerge suddenly in a mill yard, with all the busy operations of sugar-crushing, &c., going on. As the steam and the smell and heat are not inviting, and we are nearly due on the top of the hill, a mile away, to meet the ladies, we turn abruptly up the cliff face, the bottom of which we have been following, and after a stiffish pull find ourselves a couple of hundred feet above the mill. As we leave the stream, however, we take a local insect, *Mycalesis Perspicua*, a rather pretty little *Satyrus*.

The view of country, that opens out to us from this summit, is a rolling sweep of ground rising gradually, and dotted with patches of scrub, chiefly *Mimosa*. In the distance is the dark green of the Bush, in which we first adventured in the morning. The grass is rather brown and patchy, and the country is rocky, but we add to our captures the well marked *Anthocaris Eris* and *Acræa Punctatissima*, both pretty numerous and excessively local in their occurrence, this being the only spot in the country-side where I know them to occur. *Anthocaris Danæ* is caught, male and female, on some yellow flowers, feeding; and *Junonia Cloantha*, a very typical insect of this open country, is in fair plenty and good condition.

Rising the next hill we come in sight of our trysting place, and see the cart waiting for us. In order not to keep the ladies waiting we push on rather hurriedly; but, despite our gallantry, I am bound to diverge to a quarry not far out of the way in which I always can count on getting *Alæna Amazoula*, and to search a patch of rocks where *Leucochitonea bicolor* is not unusual: the latter we find, but only an old used-up specimen; the former, we take five specimens, settled on grass-stalks out of the sun on the steep quarry face.

We are hot and tired as we reach our friends, and we hail the cart with delight, and are still more pleased when we find our fair comrades have brought a boy and some tea, and that ready for us is "the cup that cheers but does not inebriate." How we sip that tea; and how pleasant it is to throw oneself on the grass in the shade and divest oneself of the paraphernalia, which was our pride as we started, but is, alas, an encumbrance now. Refreshed by our dish of tea, and entertained also by a dish of scandal,—for our fair friends, *en route* to the rendezvous, have called in at a neighbour's, and have just heard everything about everybody up to date from the best gossip of the whole country-side,—we started our "native contingent" home on foot with the spoils of the chase.

Having changed our linen sun-coats for light cloth ones we place ourselves in the hands of the ladies, who have brought out the team of four-in-hand to show the veteran the country round. As it is 5 o'clock already, and the sun sets about 6.30, we have not a long time to do ten miles in, which is the drive we propose.

By permission the nicotian weed is lit, and we are amused by a desultory conversation which goes on between us,—partly local information, partly notes on the work just done, partly tittle-tattle from the "other side" about somebody, and partly caressing remarks by John (the driver) as to the points, qualities, and idiosyncracies of the horses he is driving. The cape cart we are in is like a big dogcart, with shifting seat to balance, with a hood of white canvas over it to keep off the sun and dust; the wheels are strong and high, and for rough roads and quick travelling they are admirably adapted. After his whiff is over, instead of taking the ribbons myself, I induce the veteran, who is a lover of the art, to "try their mouths;" and John gives up his place, and the veteran takes kindly to the ribbons, and, guided by me at his elbow, lands us home.

Ten minutes with the nets in the gloaming on a patch of geraniums gives us *Pamphila Dysmephila*, on the wing with the hawk-moths, and hardly to be distinguished from *Lophura nana* of that ilk. We also take *Cyllo Leda* looking for sugar, which, by the bye, the boys have forgotten to put on; our five miles (for them eight miles) tramp and the strong tea have put the sugaring out of their heads.

In the verandah, after dinner, we discuss and count our captures, and we find just short of 400 insects to our two nets, most of them new as captures to the veteran, and all of them of interest or beauty.

Who would not, after this, wish for "such a day's" butterfly hunting in Natal.

The Cottage, Richmond Hill, Surrey, May, 1881.

INTRODUCTORY PAPERS ON *ICHNEUMONIDÆ.*

By John B. Bridgman and Edward A. Fitch.

No. II.—ICHNEUMONIDÆ (*continued*).

Trogus, *Panz.*

Thorax black with yellow marks, scutellum yellow, sometimes some red on the thorax; abdomen either entirely fulvous, or apex more or less black; greater part of legs fulvous; antennæ not white-ringed.

A. 2nd and 3rd ventral segments with a longitudinal fold in the middle. - - - - 1. *lutorius*, 10—12 lines.
B. The ventral fold on the 2nd segment only.
exaltatorius, 12—14 lines.

Trogus lutorius, Fabr., is the largest and best known of our British Ichneumons. It is by no means rare, being frequently bred from the pupæ of various *Sphingidæ* by lepidopterists, especially from *Sphinx ligustri* and *Acherontia Atropos*. Mr. R. S. Edleston records it as being very destructive to *Smerinthus ocellatus* on Chat Moss in 1838 (Entom. i. 263); we have also bred it from this host, as well as from *S. populi*. This species may be frequently captured during the summer months heavily flitting—something between a fly, a jump, and a buzz—along privet hedges, at all times of the day. The typical *T. lutorius* is figured by Albin on his Plate vii., and the variety with a black apex to the abdomen (*T. Atropos*) by Curtis on Plate 234. Mr. Marshall, for some reason not expressed, did not include *T. exaltatorius*, Panz., in his Catalogue. The species is considered good by Wesmael, Holmgren, Brischke, Tischbein, and Taschenberg; it is certainly British, being commonly bred from *Smerinthus ocellatus*.

The talented George Newport made *Trogus lutorius* the subject of one of his numerous anatomical studies, and the results are given in an important memoir communicated to the Linnean Society in June, 1849 (Trans. Linn. Soc., xxi., pp. 85—93, pl. ix.; 1853). The following is the economy of *Trogus* as observed by Newport. The egg is laid in the Sphinx-larva, probably directly after it changes its skin for the last time, since Newport found the parasitic larva more than one quarter of an inch in length about a week before the caterpillar was full fed; the *Ichneumon* larva was always "internal to the muscles, imbedded in the so-called fatty tissue, between them and the alimentary canal, and always on the dorsal surface, and usually with its head in the direction of that of the caterpillar. I have found it in different stages of growth, from one-fourth to three-eighths of an inch in length, as early as the middle of August, when it is of a light pea-green colour; but I have obtained full-grown specimens only from the pupa of the Sphinx, sometimes as early as the end of October, but more frequently not until the commencement of March, and sometimes as late as the end of April. Usually one egg only is deposited in each caterpillar, but sometimes there are two, and both become hatched, although of the parasites one only arrives at maturity, as one is invariably destroyed by the other." One case (March 13th, 1832) is fully recorded, and this apparently was by no means a unique one. "The usual situation of the parasite in the Sphinx-pupa is in the tissue of the middle part of the body beneath the dorsal vessel and above the stomach, on which it often rests. . . . The change to a nymph usually takes place in April, but when placed in water at that period it soon perishes, as its respiration has then become more active. . . . The length of time which it remains in the nymph-state is about a month or six weeks at the utmost, as most of the specimens I have bred from the pupa have appeared in June. The perfect insect makes its way out of the dead pupa of the Sphinx by perforating the case with its mandibles on the dorsal surface, and sometimes it becomes fixed in the orifice and unable to escape." The larva is described in full detail. This life-history may be taken as typical of the *Ichneumonidæ* generally; compare the remarks under *Ichneumon*.

AUTOMALUS, *Wesm.*

Thorax black; scutellum white; abdomen blue-black, apical margin of 1st segment and an oblong spot on the 7th, white; tibiæ partly pale-marked. *alboguttatus*, 6—8 lines.

Taschenberg, Holmgren, Brischke, and Tischbein, retain Wesmael's genus, as did Marshall in his first Catalogue; but later he again places *A. alboguttatus*, Gr., in *Trogus*. This species is common in Britain, and Tischbein relates that one warm day in June he met with a swarm of from thirty to forty specimens on a spot of ground less than two feet in diameter in a wooded enclosure, near the castle of Schaumburg on the Lahn (Rhenish Prussia). He examined the spot closely, but could find no pupæ or cocoons from which they could have been bred, nor anything to account for the curious assemblage (Stett. Ent. Zeit., xxxv., 298). Boie, Ratzeburg, Brischke, and Giraud, record this species as a parasite of *Orgyia pudibunda;* Vollenhoven has bred it from *Thyatira batis*, and also, doubtfully, from *Liparis auriflua*. Of the seventeen specimens in the National Collection there is one (imperfect) which Mr. Desvignes considered distinct. Foerster erected the genera *Trogus*, *Automalus*, and *Dinotomus* (new), into a new family—Trogoidæ (Verh. Pr. Rheinl., xxv., 188). This appears quite unnecessary.

ANISOBAS, *Wesm.*

Abdomen, 1st to 3rd segments red or marked with black; more or less of the apical segments marked with white; greater part of legs red; antennæ of female white-ringed, and sometimes the male also; scutellum sometimes white, sometimes black. - - 1. *hostilis*, 3½—4½ lines.

LISTRODROMUS, *Wesm.*

Basal segments of the abdomen with a pale spot on each side; 4th to 7th pale.

A. Scutellum, and marks on abdomen, yellow; antennæ, and tibiæ of the female, red, tibiæ of the male yellow, apex of hinder dark; scutellum of male black.
1. *quinqueguttatus*, 3½ lines.

B. Marks on abdomen white; thorax of female more or less red; scutellum of male black; legs dark, front legs partly pale.
2. *lapidator*, 2½—3½ lines.

The Listrodromoidæ formed another of Foerster's new families (Verh. Pr. Rheinl., xxv., 194); it included the two genera, *Listrodromus* (*quinqueguttatus*, Gr.) and *Neotypus*, Foerst. (*melanocephalus*, Gml., and *lapidator*, Fabr.). Marshall has not adopted the new genus, and Vollenhoven more recently expresses strong disapproval. Both species of *Listrodromus* in our list appear to be exceedingly rare. The first species is better known by its female name (*nycthemerus*). Gravenhorst says of the female, "unicam feminam pedemontanum Bonellio debeo," which is the one described; and of the male, "mas unicus (germanus?) erat in collectione Roentgeniana." Wesmael says, "this species appears to be excessively rare in Belgium; it is more than thirty years since I took the three females mentioned in my 'Tentamen,' and I have not seen it since." No other authors appear to know it. There are four beautiful specimens in our National Collection from Mr. Desvignes' collection (for description see B. M. Cat., p. 18). *L. lapidator* is also rare, but much more generally distributed than *L. quinqueguttatus*. Wesmael had three females from Prussia, France, and Sweden, but did not know it from Belgium. Tischbein says rare near Birkenfeld. It is very doubtfully British. Mr. Desvignes introduced Gravenhorst's *L. nobilitator* into his Catalogue (p. 29) from a specimen in his own collection; this is now in the British Museum, and certainly is not *L. lapidator*. We have good coloured figures of both these rare, but striking, species:—*L. quinqueguttatus* in Wesmael's 'Ichneumones Amblypygi Europæi' (plate, fig. 13), and *L. lapidator* in Vollenhoven's 'Pinacographia' (pl. 27, fig. 8).

HYPOMECUS, *Wesm.*

Scutellum white; abdomen black.
Marks of head and thorax whitish straw; ring of antennæ and tarsi white; femora and tibiæ red; *var.* tarsi without the white ring. - - - 1. *albitarsis*, 5—6 lines.

Wesmael gives good figures of the two sexes of this somewhat variable insect (Ich. Ambly., pl., figs. 14—17), but specially tells us that it has but little affinity with the preceding genera; it still, however, remains in the position where Wesmael left it provisionally. Brischke bred this species from *Acidalia trilineata*,* *Melanippe luctuata*,* and *Anticlea berberata*. It is generally rare, especially in Britain. Mr. Cameron has taken two specimens of the variety without the white tarsal ring, at Cadder, near Glasgow.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Clostera anachoreta.—In answer to the enquiry of the Rev. J. Greene, in the last number of the 'Entomologist (Entom. xiv. 117), I send an account of my own experience with *Clostera anachoreta.* In September, 1861, my father found a larva feeding on poplar in some small plantations below West Cliff, Folkestone; but I did not recognise the species till the pupa hatched on April 27th, 1862. The poplars in these plantations were, I think, chiefly the balsam poplar, the species with large leaves, coming out early in the spring, and with the buds resinous and fragrant. There were also a few small black and Lombardy poplars among them. This larva of *C. anachoreta* and the subsequent ones of this species we found in 1862 and 1863 were only on this "balsam poplar." In the autumn of 1862 my brother and I found twelve larvæ of *C. anachoreta:* one died when young, the other eleven changed into pupæ, all of which hatched in the following spring (1863), between April 13th and May 7th, and were all good specimens except one, which was slightly crippled. We also found that autumn (1862) larvæ of *C. curtula, C. reclusa, Notodonta ziczac, N. dictæa,* and *Dicranura vinula;* but all the species of *Clostera* were on the balsam poplar. In October, 1863, we found *N. ziczac* and *N. dictæa,* and one larva of *C. anachoreta,* which we did not keep, as we had bred them in plenty. During that month we turned out eighty-four nearly full-fed larvæ of *C. anachoreta,* but not all bred from the same parents, in different places along these plantations. We put the larvæ on the same species of poplar we had first found them on, in order thoroughly to establish the species there; but since that date we have neither of us seen the larva of *C. anachoreta* there, although we have been at Folkestone every autumn up to the present time. This may be partly owing to the fact that most of these young poplars have died, or had their lower branches trimmed and grown too high to search; neither have we since that date (1863) found there the other larvæ just mentioned. Not having been down at Folkestone much in the spring of the year, I have not often been able to search for the spring brood of *C. anachoreta.* I may mention that, so far as my own experience goes, the larvæ of *C. anachoreta* here fed only on the lower branches of these balsam poplars, and each time it moults it spins a white web between the leaves. Not having seen an *Anachoreta* larva for eleven years, I was deceived in the spring of 1874 by finding some young larvæ in these plantations, which proved to be those of *Liparis salicis*. I do not remember having seen a published description of the *young* larvæ of this species, which have a small tuft of black hair on the 5th and 6th segments, and a smaller tuft of pale hair on the 11th and 12th segments; these tufts, characteristic of the family, were conspicuous while the larvæ were very young, but became almost obsolete as they became full fed. They spin between leaves for moulting, in exactly the same manner as the larvæ of *Clostera*. When I returned home and compared these young larvæ with the description of that of *C. anachoreta*, made by myself, I saw my mistake, but did not recognise them as those of *L. salicis* until their last moult. To save others from making a similar mistake I append a description of the larva of *C. anachoreta*:—Head dark brown; two conspicuous tubercles, one on the 4th and one on the anal segment; anterior segment black at the base, crowned with crimson, with a *large white spot* on each side of it, and another minute spot in front of the large spot; posterior segment blackish at base, and crowned with chestnut colour. Back pale buff, with a dusky dorsal stripe, and another on each side of this stripe and parallel with it; sides dark bluish grey, minutely lineolated with black. Feet and abdomen dirty dark buff; above the feet an interrupted orange line, with an interrupted black line immediately above it; spiracles orange, and along the margin of the buff back is a row of orange spots, with an angulated black spot under each of them.—T. H. Briggs; Hampton House, Teddington, May 14, 1881.

Description of the Larva of Heliophobus hispida.—On March 18th, 1879, I received from Mr. G. C. Bignell, of Stonehouse, Plymouth, three larvæ of this species, which had been sent to him from Torquay. Being about full grown I described them at once, as follows:—Length nearly an inch and a half, and of moderate bulk in proportion; head polished, has the lobes rounded, and is very slightly narrower than the 2nd segment; body cylindrical, and of nearly uniform width throughout; segmental divisions well defined, the skin smooth and soft; the ground is a stony greyish brown, strongly suffused in some specimens with rust-colour, and this rust-colour will probably show at the segmental divisions in most examples; head pale brown, with darker mandibles, and a conspicuous streak of dark sienna-brown on the upper part of the inner side of each lobe, and a similarly coloured spot on the outer edge of each lobe; two fine dark smoky lines, enclosing between them an indistinct pale line, form the dorsal stripe; subdorsal lines greyish yellow, bordered above with a series of longitudinal dull black streaks and below with a series of large marks of a similar colour, these lower marks, however, being very indistinct on the frontal segments; there is only a faint indication of a very fine pale line along the spiracles; spiracles intensely black; ventral surface, legs and prolegs uniformly of a dingy greyish tint, and the skin so translucent that the working of the muscles of the whole surface can be distinctly seen through it. Feeds on grass, and when full fed forms below the surface, amongst the roots of the grass, a tolerably compact cocoon of silk and earth. The pupa is about half an inch long, and rather dumpy in appearance, being broad across the thorax, but the abdominal divisions much narrower, and tapering sharply off to the anal point; neither the head-, leg-, nor wing-cases are at all prominent, the whole surface being rather evenly and bluntly rounded; it is polished, and almost uniformly of a bright brown colour, the colour indeed being exactly that of the familiar pupa of *Mamestra brassicæ.* Two beautiful imagos, male and female, emerged on September 26th. — GEO. T. PORRITT; Highroyd House, Huddersfield, May 3, 1881.

LYCÆNA AGESTIS IN DERBYSHIRE.—During the last week of May, 1880, I took large numbers of *Lycæna Agestis* at Dovedale, four miles from here. They were confined to a very limited locality about six yards square, on the marshy side of a hill, fluttering among the rank grass with *Lycæna Alexis* and *Chortobius Pamphilus.* I never remember seeing them in any other locality near here.—T. H. HALL; Ashbourne, Derbyshire.

LYCÆNA ARGIOLUS.—I caught a female *Lycæna Argiolus* in my garden here on Easter Sunday afternoon, April 17th. This seems rather early, especially having regard to the long-continued easterly winds which have prevailed. Newman, in his 'British Butterflies,' only mentions one capture so early as April 9th, the usual time being May, and later.—HORACE FRERE; Queen's Road, Kingston-on-Thames, April 20, 1881.

Arctia fuliginosa.—An example of *Arctia fuliginosa*, bred from a cocoon sent me from Scotland, which emerged May 12th, has the cilia of the hind wings an intense black, instead of the usual bright rosy red. Is not this somewhat uncommon? The Scotch specimens of this moth appear to be smaller and darker than our own.—Joseph Anderson, jun.; Chichester.

Acronycta alni.—I had the pleasure of breeding a beautiful specimen of *Acronycta alni* on May 14th, from a larva found in the New Forest last summer; and on the 18th another emerged in good condition, but smaller in size.—Id.

New locality for Orthosia suspecta.—When sugaring last August in the North of Kent I took two specimens of *Orthosia suspecta*. I was at first puzzled; but it was named for me by a well-known entomologist. To be certain on the matter I went to the British Museum, and examined the series there.—R. W. Bowyer; Haileybury, Hertford, May, 1881.

Notes on Micro-Lepidoptera near Preston.—*Coleophora olivaceella.*—I was fortunate enough to find, last year, cases of this rare insect at Armathwaite, near Carlisle. When first noticed, attached to the trunks of trees above *Stellaria holostea*, they were supposed to be cases of *C. solitariella;* and it was not until the autumn, when I had time to compare the perfect insects, which emerged, with a description in a number of the 'Entomologist's Intelligencer,' that the truth was suspected. The larvæ of *C. olivaceella* appear to feed up in the autumn and retire to tree trunks, and perhaps other similar places, for refuge during the winter. The cases are like those of *C. solitariella*, but lie almost prostrate, instead of standing straight out from their resting-place. I have not yet seen the mine, as those bred last year and collected at Whitsuntide, and those collected this Easter, have refused food, and appear to be in the pupa state. In a notice some years ago by Mr. Stainton he represents the mine as being greener than that of *C. solitariella*, and he found larvæ feeding in April. This is rather puzzling, and I do not quite see how the difficulty is to be surmounted. The perfect insect is rather like *C. solitariella*, but is larger, of a darker colour, its wings are broader and more glossy; and when the series of each insect are compared the difference is at once most distinctly apparent. *Xysmatodoma argentimaculella.*—I think that Armathwaite has always yielded the larvæ of this insect, as I found many delicate tubes amongst the grey lichen on the rocks, tenanted by light green larvæ with black heads. As I cannot find anywhere a description of the larva of this species, this must be considered a mere conjecture, hazarded with the view of extracting information from anyone who may know. *Elachista humiliella.*—This insect puzzles me. Can it be the male of *Elachista perplexella?* The 'Manual' says of it, "male unknown." Now in Brockholes Wood, near Preston, I take yellow larvæ feeding in *Aira cæspitosa*, which produce both the dark males and the females with more distinct spots; and these, I venture to say, are probably respectively *E. humiliella* and *E. perplexella*, thus reducing the two species into one, whichever name may have the priority. Mr. Murray, of Carnforth, was last year most fortunate in his captures at Witherslack amongst the Micros. He took, and kindly gave to me, a male of *Psyche opacella* and one of *P. calvella*, and it will be curious if we cannot this year turn up these insects again.—J. H. THRELFALL; Preston, April 27, 1881.

HYMENOPTERA IN DORSETSHIRE.—While searching for spiders among heather, coarse herbage and *débris*, I have on various occasions met with the following, mostly apterous, Hymenoptera. I am indebted for the names of these little insects to Dr. Capron, of Shere, near Guildford, and Mr. Bridgman, of Norwich, who have kindly examined the specimens. *Pezomachus micrurus*, Foërst., appears to be new to Britain. I should add that one of the examples of *Hemimachus fasciatus*, Fabr., male, was bred from the egg-sac of a species of *Theridion. Methoca ichneumonoides*, Latr.; *Ichneumon luctatorius*, Lin.; *Lissonota bellator*, Grav.; *Theroscopus subzonatus*, Grav.; *Hemimachus instabilis*, Foërst.; *H. fasciatus*, Fabr., male and female, male bred from spider's egg-sac; *Aptesis hemiptera*, Grav.; *A. nigrocincta*, Grav.; *Pezomachus pumilus*, Foërst.; *P. micrurus*, Foërst., new to Britain; *P. zonatus*, Foërst.; *P. corruptor*, Foërst.; *P. insolens*, Foërst.; *P. attentus*, Foërst.; *P. transfuga*, Foërst.; *P. tener*, Foërst.; *P. Mülleri*, Foërst.; *P. Kiesenwetteri*, Foërst.; *P. festinans*, Grav.; *Spathius clavatus*, Nees; *Chasmodon apterus*, Nees.—Rev. O. PICKARD-CAMBRIDGE; Blandford, Dorset, May 5, 1881.

HYMENOPTEROUS PARASITES OF LEPIDOPTERA.—Many bred specimens of parasitic Hymenoptera have passed through my hands during the last year. It is necessary their record should be preserved for other and future workers; still I may say that already the knowledge gained of habits and economy is likely to lead to very useful results. Nearly all the specimens of *Ichneumonidæ* have been examined, and many determined, by Mr. Bridgman. This list is uniform with last year's (Entom. xiii. 67), the names in the parentheses being those of the correspondents who have bred the species. Several specimens still stand over for further consideration; and it is somewhat useless, at present, giving specific names to the large numbers and numerous species of *Pteromalidæ*, *Entedonidæ*, *Elachistidæ*, &c., bred by Messrs. J. Sang, G. Elisha, and others, from various *Lithocolletidæ* and *Nepticulidæ*. Walker is very difficult to follow, but the specimens will all be carefully preserved, and at the disposal of any future worker at the interesting *Chalcididæ*, which group, I may state by the way, certainly *ought* to be taken up in this country, considering the vast amount of material we possess. Nearly all the *Microgasteridæ* and *Perilitidæ* are named by Dr. H. Reinhard, of Dresden. Altogether the list includes thirty-five species of *Ichneumonidæ* and *Braconidæ* new to Britain; their names are printed in small capitals. Many of these are referred to, and a few described in Mr. Bridgman's paper, now publishing in the current part of the Trans. Ent. Soc. (pp. 143–168, plate viii.):—

Ichneumon lineator, F., from *Gortyna flavago* (J. Sang); low plant-feeding Noctua (G. T. Porritt)
I. impressor, Zett., from *Gortyna flavago* (J. B. Bridgman).
I. trilineatus, Gml., from *Abraxas grossulariata* (G. C. Bignell).
I. multiannulatus, Gr., from *Noctua brunnea* (Bignell).
I. gracilentus, Wesm., from *Tryphæna fimbria* (H. M. Golding-Bird, Bignell).
I. saturatorius, L., from *Nonagria typhæ* (E. A. F. and Fitch, Bignell).
I. fabricator, F., from *Axylia putris* (Bridgman); *Xylophasia rurea*, *H. adusta* or *A. gemina* (Sang).
I. jugatus, Gr., from *Tephrosia extersaria* (Bignell).
Exophanes occupator, Gr., from *Nonagria sparganii* (W. R. Jeffrey).
Amblyteles armatorius, Forst., from *Tryphæna pronuba* (E. A. Butler).
A. oratorius, F., from *Aplecta nebulosa* (Bignell).
A. HOMOCERUS, Wesm., from *Argynnis Paphia* (Bignell).
Eurylabus dirus, Wesm., from *Eriogaster lanestris* (Bignell); bred by Mr. T. Wilson, possibly from *E. lanestris*.

E. larvatus, Christ, from *Stauropus fagi* (F. D. Wheeler, Bridgman).

Platylabus pedatorius, F., from *Eupithecia subnotata* (Golding-Bird).

P. THEDENII, Holmgr., from *Emmelesia unifasciata* (G. Elisha).

Phæogenes candidatus, Gr., from *Tortrix viridana* (Bignell).

Ischnus nigricollis, Wesm., from *Pterophorus* (*Aciptilia*) *galactodactylus* (C. G. Barrett, Bridgman).

Stilpnus deplanatus, Gr., from larva feeding on honeysuckle (Butler).

Cryptus obscurus, Gr., from *Hadena thalassina* or *Noctua plecta* (Sang).

C. rufiventris, Gr., from *Talæporia pseudobombycella* (J. E. Fletcher).

C. migrator, F., var. from *Euchelia Jacobeæ* (Sang).

C. fumipennis, Gr., from *Saturnia carpini* (Barrett, Bridgman).

Mesostenus obnoxius, Gr., from *Zygæna filipendulæ* (W. Bennett, Butler, E. A. F.).

Hemiteles fulvipes, Gr., from *Vanessa Atalanta* (Bridgman); *Plusia chrysitis* (V. R. Perkins). Probably hyperparasitic.

H. castaneus, Tasch., female, from *Exæretia Allisella* (Sang).

H. sp.? from *Dianthæcia capsincola* (Bignell).

H. sp.? from *Lithocolletis Schreberella* (E. Parfitt).

APTESIS VESTIGIALIS, Foerst., from *Coleophora solitariella* (G. C. Champion). Non *A. Hopei*, Entom. xiii. 68.

Hemimachus palpator, Gr., male, from *Coleophora melilotella* (S. Webb); *Eupœcilia atricapitana* (Barrett, Bridgman).

H. rufocinctus, Gr., male, female, from *Coleophora genistæ* (Fletcher). Female from *Gracillaria phasianipennella* (Sang).

H. fasciatus, F., male, female, parasitic on *Microgasteridæ* (F. Norgate, J. B. Bridgman).

Pezomachus insolens, Foerst., female, from *Saturnia carpini* (Barrett, Bridgman).

P. PROCURSORIUS, Foerst., male, with cocoon (*? Microgasteridæ*), bred 2nd August, 1880 (Bignell).

P. N. S.? female, from *Coleophora melilotella* (Sang).

P. N. S.? female, near *fraudulentus*, Foerst., from *Coleophora artemisiella* (Sang).

Ophion luteum, L., from *Leucania lithargyria* (Butler); *Hadena pisi* (H. Marsh).

Anomalon fibulator, Gr., from *Zygæna loniceræ* (W. P. Weston).

A. clandestinum, Gr., from *Hemithea thymiaria* (Bignell); *Eupithecia linariata* (Barrett, Bridgman).

Agrypon tenuicorne, Gr., male, from *Dianthæcia capsincola* (Bignell).

A. canaliculatum, Ratz., from *Pædisca sordidana* (Sang).

Paniscus cephalotes, Holmgr., from *Dicranura vinula* (Wilson).

P. testaceus, Gr., from *Hadena pisi* (Marsh).

P. TARSATUS, Brischke, from *Eupithecia abbreviata* (Bignell).

Campoplex mixtus, Gr., from *Pygæra bucephala* (F. Norgate, Bridgman).
C. pugillator, L.? from *Corycia temerata* (Bignell).
C. orbitalis, Gr., from *Abraxas grossulariata* (Weston).
Casinaria mesozosta, Gr., from *Nudaria mundana* (Barrett, Bridgman).
C. vidua, Gr., from *Abraxas grossulariata* (Bignell); *Zygæna trifolii* (Weston).
C. tenuiventris, Gr., from *Hemithea thymiaria* (Bignell, Butler).
Limneria aberrans, Gr., male,? from *Laverna conturbatella* (G. Elisha).
L. BARRETTII, Brdg., from *Pterophorus* (*Oxyptilus*) *teucrii* (Barrett).
L. CARBONARIA, Brischke, from *Cidaria pyraliata* (Bignell).
L. cerophaga, Gr., from *Gracillaria stigmatella* (Sang).
L. CLANDESTINUM, Holmgr., from *Lomaspilis marginata* (Bignell).
L. CLAUSA, Brischke, from *Hybernia progemmaria* (Bignell).
L. COXALIS, Brischke? from *Eupithecia rectangulata* (Bignell).
L. crassicornis, Gr., from *Leucania lithargyria* (Parfitt).
L. DEFICIENS, Gr.? from *Eupithecia pulchellata* (Cifton, Bignell).
L. *difformis*, Gml., from *Lomaspilis marginata* (Bignell).
L. erucator, Zett., from *Penthina gentianana* (Bennett, Butler).
L. femoralis, Gr., from *Coleophora lineolea* (Bridgman; Fitch).
L. fenestralis, Holmgr., from *Botys verticalis* (Bignell); *Depressaria hypericella* (Elisha).
L. FITCHII, Brdg., from *Nola albulalis* (Bignell).
L. majalis, Gr., from *Botys verticalis* (Porritt).
L. melanosticta, from *Lampronia prælatella* (Parfitt).
L. mæsta, Gr., from *Hybernia progemmaria* (Bignell); *H. defoliaria* (Bignell),
L. MONTICOLANA, Brdg., from *Elachista monticola* (Sang).
L. mutabilis, Holmgr., from *Ebulea sambucalis* (Bridgman); *Sciaphila virgaureana* (Sang); *Penthina gentianana* (Butler); *Notocelia Udmanniana* (Barrett, Bridgman)
L. nana, Gr., from *Laverna conturbatella* (Elisha); *L. epilobiella* (Fletcher).
L. obscurella, Holmgr., from *Orgyia antiqua* (W. Bennett, Butler); *Hemithea thymiaria* (Bignell).
L. Paniscus, Gr., from several *Lithocolletes* (Sang).
L. ruficincta, Gr., from *Dianthœcia irregularis* (Mrs. Hutchinson, Bignell).
L. tibialis, Gr., from *Gracillaria phasianipennella* (Sang).
L. TRICINCTA, Gr., from *Ebulea stachydalis* (Barrett, Bridgman).
L. tumidula, Gr., from *Glyphipteryx Haworthana* (Wheeler, Bridgman).
L. VOLUBILIS, Holmgr., from *Coleophora laricella* (Elisha).
L. s. s., male, from *Elachista cerussella* or *Triatomella* (Sang).
L. sp.? male, from *Lithocolletis tenella*, *Bremiella*, or *betulævorella* (Sang).
Cremastus infirmus, Gr., from *Carpocapsa splendana* (E. A. F.).
C. bellicosus, Gr., from *Psyche villosella* (M'Rae).

Mesochorus sericans, Curt.? from *Abraxas grossulariata* (Bignell).

M. semirufus, Holmgr., captured piercing *Eupithecia castigata* (Bignell).

M. sylvarum, Hal., from *Apanteles* on *Vanessa Atalanta* (Bignell).

M. olerum, Curt., female? from *Gracillaria phasianipennella* (Sang).

M. GRACILENTUS, Brischke, female, from *Gonepteryx rhamni* (Bignell).

M. ACICULATUS, Brdg., female, from *Apanteles* on *Pieris brassicæ* (Bignell).

M. sp.? from *Melanippe galiata* (Bignell).

M. sp.? from *Abraxas grossulariata* (Bignell).

Exetastes osculatorius, F., from *Mamestra brassicæ* (Bignell); *Miana furuncula* (S. L. Mosley, S. D. Bairstow).

E. illusor, Gr., from *Mamestra persicariæ* (Weston).

Banchus pictus, F., from *Selenia illunaria* (Bignell).

Mesoleptus testaceus, F., from *Eupithecia castigata* (Bignell).

Exochus prosopius, Gr., from a Tortrix (Butler).

E. alpinus, Zett., from black Tortrix larva on honeysuckle (Bignell).

Bassus nigritarsus, Gr., from *Bombyx quercus* (Bignell).

B. elegans, Gr., from *Gracillaria phasianipennella* (Sang).

PIMPLA DILUTA, Ratz., from *Pyrameis cardui* (Barrett, Bridgman).

P. instigator, F., from *Diphthera Orion* (Wheeler, Bridgman).

P. examinator, F., from *Tortrix viridana* (Bignell); *Ornix torquilella* (Sang).

P. flavonotata, Holmgr., from *Tortrix viridana* (Bignell).

P. scanica, Vill., from *Tortrix viridana* (Bignell); *Argyresthia nitidella* (Sang); *Gracillaria stigmatella* (Sang).

P. stercorata, F., from *Eupithecia linariata* (Bignell).

P. brevicornis, Gr., from *Gelechia intaminatella* (Sang); *Coleophora melilotella* (Webb).

Glypta scalaris, Gr., from *Ypsipetes elutata* (G. H. Raynor).

Lissonota maculatoria, F., from *Phycis Davisella* (? *genistella*, Dup.) (Mrs. Hutchinson, Bignell).

L. CALIGATA, Gr., from *Anticlea badiata* (Bignell).

Phytodiætus segmentator, Gr., from *Pædisca sordidana* (Sang).

P. coryphæus, Gr., from *Tortrix viridana* (Bignell).

Bracon minutator, F., from *Parasia carlinella* (Elisha).

B. sp.? from *Pædisca solandriana* (Elisha).

Spathius clavatus, Panz., from "probably *Sericoris littorana*" (Barrett). Query error, as this species is a general parasite of *Anobium* and allies.

Chremylus rubiginosus, Ns., from *Tinea granella* (Perkins).

PETALODES UNICOLOR, Wesm., from *Clostera reclusa* (Norgate, Bridgman).

Rhogas reticulator, Ns., from *Odonestis potatoria* (Bignell).

R. circumscriptus, Ns., from *Ebulea crocealis* (Bignell).; *Thera firmata*, *T. variata* or *Ellopia fasciaria* (Sang).

Chelonus sp.? from *Elachista monticola* (Sang).

Ascogaster similis, Ns., from *Penthina gentianana* (Elisha).

Microgaster subcompletus, Ns. (*annulipes*, Curt.), from *Vanessa Atalanta* (Bignell); *Euchelia Jacobeæ* (Butler).

M. alvearius, Fab., Spin., from *Boarmia rhomboidaria* (Bignell).

M. flavipes, Hal., from *Boarmia repandata* (Bignell).

M. MINUTUS, Rhd., from *Cleora glabraria* (Elisha; Billups; Butler; E. A. F.).

M. PUBESCENS, Ratz., from *Thera variata* (= *obeliscata*) (Bignell).

M. connexus, Ns., from *Liparis auriflua* (E. A. F.).

Microplitis ocellatæ, Be. (= ? *ingratus*, Hal.), from *Smerinthus ocellatus* (Bridgman; B. Brown; E. A. F.); *S. populi* (Bignell; T. Wilson; E. A. F.).

M. TUBERCULIFER, Wesm., from *Polia flavocincta* (Bignell).

APANTELES SOLITARIUS, Rtzb. (? = *lineola*, Curt.), from *Tæniocampa stabilis* (Bignell); *Orgyia antiqua* (Bignell).

A. ruficrus, Hal., from *Plusia iota* (Perkins; Bignell); *P. chrysitis* (Bignell); *Plusia* larva on *Lamium album* (Butler).

A. congestus, Ns. (= *intricatus*, Hal.), from *Tryphæna pronuba* (Bignell).

A. rubripes, Hal., from *Geometra papilionaria* (Bignell); *Cabera pusaria* (Bignell); ? *Notodonta ziczac* (Bignell).

A. glomeratus, L., from *Pieris brassicæ* (generally).

A. SPURIUS, Wesm., from *Satyrus Hyperanthus* (Butler); *Amphydasis betularia* (Bignell).

A. juniperata, Bé., from *Zygæna filipendulæ*, *Selenia illunaria*, *Hybernia defoliaria*, *Ephyra punctaria*, and *Cidaria fulvata* (Bignell).

A. difficilis, Ns. (= *vestalis*, Hal.), from *Arctia caja* (Billups; E. A. F.), *Euchelia Jacobeæ* (Bignell); *Selenia illunaria* (Butler); *Amphydasis prodromaria* (Bignell); Geometer feeding on hazel (Butler); *Hadena pisi* (Mrs. Walker, Bignell).

A. TENEBROSUS, Wesm., from *Acrolepia pygmæana* (Bignell).

A. PALLIPES, Rhd., from *Plusia chrysitis* (Billups).

A. bicolor, Ns. (= *exiguus*, Hal.), from *Lithocolletis lantanella* (Elisha, Billups); *L. scopariella* (Saug).

A. FORMOSUS, Wesm., var., ? from *Ourapteryx sambucaria* (Bignell).

A. vitripennis, Curt., Hal., from *Diloba cæruleocephala* (Laddiman, Bridgman).

A. fulvipes, Hal., from *Liparis auriflua* (Butler; E. A. F.); *Cidaria fulvata* (Butler); *Tryphæna orbona* (Bignell; E. A. F.); *Noctua xanthographa* (Bignell); *Catocala nupta* (Butler); *Elachista paludum* and *E. cerussella* (Saug); various *Lithocolletidæ* (Saug; Elisha).

A. SOTHUS, Rhd., n. s., from *Melanippe galiata* (Bignell; R. M. Sotheby, Butler); *Cidaria pyraliata* (Bignell); *Geometra sp.* ? (Bignell).

A. N. S., from *Chilo phragmitellus* (Porritt).

Hybrizon buccatus, Bréb., from *Plusia chrysitis* (Billups).

Zemiotes albiditarsus, Curt., from *Trachea piniperda?* (Bridgman). Fluffy ochreous cocoon.

Perilitus (*Meteorus*) *deceptor*, Wesm., from *Crocallis elinguaria* (Bignell); Geometer feeding on hazel (Capron).

P. ictericus, Ns., from *Hemithea thymiaria* (Butler).

P. PULCHRICORNIS, Wesm., from *Cheimatobia brumata* (Bignell).

P. scutellator, Ns., from *Tæniocampa stabilis* (Bignell).

P. scutellator, var., from *Thecla W-album* (Perkins).

P. unicolor, Wesm., from *Clostera retusa* and *Orthosia lota* (Bignell).

P. MEDIANUS, Rthe., from *Agrotis tritici* (Bignell); *Leucania lithargyria* (Butler).

P. fragilis, Wesm., from *Miselia oxyacanthæ* (Butler).

Zele testaceator, Curt., from *Leucania obsoleta* (Butler); ——— (Bignell). Thin, smooth, white cocoon.

Macrocentrus linearis, Ns., from *Botys verticalis* (Porritt).

M. linearis var. *pallipes*, Ns., *Hypermæcia angustana* (Sotheby); *Depressaria nanatella* (Elisha); *Gelechia Mouffetella* (Elisha).

M. marginator, Ns., from *Xylophasia rurea*, *H. adusta*, or *A. gemina* (Sang); *Catoptria hypericana* (Elisha).

Eulophus ramicornis, Geof., male, female, from *Demas coryli* and *Notodonta camelina* (Billups).

Eulophus sp.? female, from *Hybernia rupicapraria* (Bignell).

Copidosoma chalconotum, Dalm., male, female, from *Depressaria nervosa* (Bignell; E. A. F.).

Holcothorax testaceipes, Ratz., from oak *Lithocolletidæ* (Sang).

Encyrtidæ from *Semasia rufillana* (Sang); *Cemiostoma laburnella* (Elisha), &c.
—EDWARD A. FITCH; Maldon, Essex.

CONTRIBUTION TO THE LIFE-HISTORY OF THE TORTRICIDÆ: PENTHINA POSTREMANA BRED.—At page 283, vol. xiii., of the 'Entomologist,' I described the larva of *Penthina postremana*, found by me last autumn near Belle Grange, on the banks of Windermere Lake, and can now add that the larva lived throughout the winter within the stems of its food-plant. In April it appears less stout (not so fat) than when it ceased to feed in autumn, but is much more active; that is it moves much faster up or down the stem in which it has hybernated. A little later it makes somewhat pellucid diaphragms, or slight partitions, in the stem, and changes to an elegantly formed rich sienna-coloured chrysalis between the partitions it has made within the stem, and appears in all its beauty in the perfect state about 9 o'clock on warm mornings about the middle of May. It is of dull sluggish habits as an insect in the perfect state. Whilst eating and growing during autumn the larvæ live within the stems and root of the plant, eating the pith. When the plants begin to decompose, the interior of the stems in which the larvæ are living become vessels full of water. This distressed me much, as I feared the larvæ would be drowned, but they seem rather to enjoy it. As the liquid dries up they are equally at home and comfortable for the next four months within the dry stems, laying dormant until the warmth of spring calls them to complete their metamorphosis. —C. S. GREGSON; Liverpool, May 22, 1881.

ENTOMOLOGICAL NOMENCLATURE.—I must say I protest against the useless and unscientific method of giving person's names to species; and I quite agree with Mr. C. A. Briggs when he says that if such names are occasionally given they should only be taken from leading or very energetic entomologists deserving such a reward, for as such it ought to be given, and then only to those who recognise the great honour conferred upon them.—E. A. BRUNETTI; 15, Lower Grosvenor Place.

NOTICE OF NEW BOOK.

The Butterflies of Europe. Illustrated and described by HENRY CHARLES LANG, M.D., F.L.S., &c. London: L. Reeve & Co.

WE have received a specimen plate and circular of this promising work. The plates will be prepared by Messrs. West, Newman & Co., and those already produced are an example of the very fine colour-printing of Natural History subjects executed by that firm. It is evident this will become the standard work upon the subject, and, being issued in parts, it will be within the reach of every entomologist. Each monthly part will contain four coloured plates, and sixteen pages of letterpress. It is intended to represent both upper and under sides, where necessary, of the butterflies, as well as the more important named varieties, and larvæ, &c., when possible. It is estimated that the work will be complete in twenty parts, which are charged 3*s.* 6*d.* each part. We hope the work will command the circulation it deserves, and that it will give an impetus amongst English entomologists to the study of insects other than those inhabiting these islands.—ED.

ERRATUM.—In our last number, p. 115, line 16 from foot, *for* "ATTACUS LUNA" *read* "ATTACUS SELENE."

THE ENTOMOLOGIST.

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JOHN BLACKWALL, F.L.S.

(OBITUARY NOTICE.)

On the 11th of May, 1881, and in the ninety-second year of his age, a veteran in natural science, John Blackwall, passed away from us. The gap made by the loss of a scientific worker at so advanced an age is perhaps less (at any rate it is usually less immediately felt) than that created by the death of one called away in the prime of life and in the midst of work; still the loss we are now deploring is great, and cannot but be very deeply felt both by science and the more immediate circle of friends and relations. Few lovers of Natural History have enjoyed the advantages of leisure and locality in the abundance enjoyed by the late Mr. Blackwall. From a very early date the ties of professional business gave way to those merely of family affairs, though few, even so disengaged, have left so many marks behind them of an active scientific mind and patient observation.

Mr. Blackwall was descended from an old Derbyshire family, taking its name and rise from Blackwall (or Blackwell) in that county; but the family had, previously to the birth of the late Mr. John Blackwall, migrated to Lancashire, where, at Crumpsall Old Hall, near Manchester, he was born on the 20th of January, 1789. Here the love of Natural History and Science became very early evident in a devotion of his leisure to Ornithology, as well as to Botany, Astronomy, and Meteorology, on all which subjects he has left published records.

Various phenomena connected with spiders and their webs, particularly in the form of gossamer, led Mr. Blackwall to turn his attention to the little spinners themselves; but to his surprise, with the exception of the work, in Latin, of Martin Lister, published by the Royal Society in 1678, he found scarcely any authorities from which the information he so much needed could be obtained. This, however, determined the main lines along which his subsequent Natural History work was directed. Thenceforth, from about the year 1820, if not earlier, the *Araneidea* (or *true* spiders) became the objects of an intensity of interest which never afterwards flagged; even continuing unabated long after defects of sight, and other concomitants of advanced age, prevented any actual work among them. As time went on other works on spiders, notably those of Baron Walckenaer and C. L. Koch, made their appearance, and, as well as their authors, came under Mr. Blackwall's notice; but his singularly retired and unobtrusive life led, in some instances, to a complete and unfortunate isolation from both authors and works in this branch of Natural History; and, with perhaps no more than two or three exceptions, Mr. Blackwall's labours were for a long time equally unnoticed, even probably unknown, by foreign workers. Thus, to note one instance only, the materials for the great work of this portion of Mr. Blackwall's life, his 'History of the Spiders of Great Britain and Ireland,' were accumulating, *pari passu*, with those in Sweden of Nicolas Westring, for his invaluable work, 'Araneæ Suecicæ,' the two works being published in the same year, 1861; and yet these two authors were, up to that time, wholly unknown to each other, either by correspondence or in the results of their several labours. Working on, almost wholly unaided by any other English worker, for forty or more years, in the investigation of the spiders of his own immediate localities, and their habits and economy, Mr. Blackwall published, besides an independent work, 'Researches in Zoology' (1834), (chiefly occupied by very interesting chapters on ornithological subjects), numerous papers on Araneology in different Natural History and scientific journals, recording many species of spiders met with, and the observations made upon them. It may not be uninteresting to note these papers in some detail, as a proof of this constant and unwearied work. Among the earliest papers published on spiders are *six* which appeared in vols. iii., viii. and x., Edinb. Philosoph. Mag., 3rd ser., 1833—36 (some of the contents of the earlier of these papers were reprinted in 'Researches in Zoology'). Contemporaneously with some of these, and also following them, were *six other papers* in Trans. Linn. Soc., vols. xvi., xviii., xix. and xxi. (1833—1855). Meanwhile, with a view to stirring up an interest in the study of our indigenous spiders, *fifteen articles* from Mr. Blackwall's pen appeared in the Annals and Mag., N. H., 1851—1857, giving a catalogue of all the then known British spiders, with remarks on their structure, functions, economy and systematic arrangement. It was during the publication of some of the later of these articles that—through Mr. R. H. Meade, of Bradford, Yorkshire—I first became acquainted with Mr. Blackwall; in fact it was chiefly owing to an interest awakened by this series of articles that I was myself first induced to take up the study of spiders; and from that time, to a short time only before his death, our correspondence on this subject was constantly carried on. It is scarcely necessary, at any rate for those who knew Mr. Blackwall, to say that he never spared time or trouble, and frequently cost also, in giving his most valuable, and valued, assistance.

Besides the papers and articles already noted, *thirty-three others* connected with spiders appeared in the Annals and Mag., N. H., 1841—1847; *three* in Journ. Linn. Soc., vol. vii. (1864) and vol. x. (1870). Mr. Blackwall also contributed papers to the Proceedings of the British Association for the advancement of Science in 1833, 1842, and 1844; the last of these appeared under the title of "Some recent researches into the structure, functions and economy of the Araneidea, made in Great Britain." Among the latest publications from Mr. Blackwall's pen is one on the spiders of the Seychelle Islands; this appeared in the Proc. of the Roy. Irish Acad., 2nd ser., vol. iii., 1877. It had, however, been written in 1871 or 1872; and in 1877, in the then declining state of the author's health, this paper was, by his own wish, submitted to myself for such revision as might be needed, owing to the changes in the state of araneological science since it was penned. A short paper, entitled "A concise notice of observations on certain peculiarities in the structure and functions of the Araneidea," appeared in the Annals and Mag., N. H., 1874. This is, I believe, the last that proceeded from his pen.

The above brief summary shows how constantly and actively Mr. Blackwall was engaged in his favourite branch of natural science up to the great age of, at least, eighty-six years. His interest in the subject, however, by no means ended then, for I myself continued to receive letters from him upon it up to September 18th, 1879. This is the date of his last letter, and in this letter he kindly permits me to dedicate to him a work then in the press, 'The Spiders of Dorset,' of which the second (and concluding) part was published only a few days after his decease.

Anything like a minute account or criticism of Mr. Blackwall's works is impossible here. Without a doubt his chief work is that published by the Ray Society, 1861—64. This appeared under circumstances of great disadvantage: not only had the MS. been in the hands of that Society for ten years before it was published, but just at a most critical point the serious and prolonged illness of Mr. Tuffen West, the artist engaged upon the plates, threw the whole into a confusion, from which it was my own happiness and privilege to be able to lend a hand in its extrication. This Work sums up all Mr. Blackwall's previous labours in the investigation of British spiders; and if it has not served to advance, as much as from its own merit it ought to have done, the popularity of Araneology in England, this may be set down mainly to its unwieldly size—large folio, to its great cost, and the difficulty of getting copies of it.

With regard to the quality of Mr. Blackwall's works in general, evidences are everywhere abundant of a clear and logical mind, most conscientious and painstaking in the elucidation of facts by actual experiment and in the description of details. To the ordinary reader these details may be perhaps at times somewhat wearisome, and bearing the appearance of unnecessary repetition; but to the scientific student they present an almost photographically-true picture of the object under notice. This character in the descriptions of our spiders in the Ray Society's volume has been objected to as a defect, and as hindering the popularity of the work; but although a certain amount of breaking-up into paragraphs would have made these descriptions more easy of reference, yet such real objection as there may be in this goes merely to the *manner*, not to the *matter*, of the work. There can be no hesitation in saying that taken in consideration with its actual date (which, as before observed, must be set at least ten years previous to publication) and with the disadvantages of isolation from other authors and works, this volume on the spiders of Great Britain and Ireland will yet go down to posterity, both in England and in foreign countries, as one indispensable to every student of Araneology.

It should be mentioned that in the investigation of the structure of spiders Mr. Blackwall almost entirely lacked the help of a good microscope, nearly all his work being effected by means of a strong pocket-lens; yet he was the first observer who ascertained and used the minute and often complex structure of the male palpi of spiders as a most important character for the determination of very similarly coloured and closely allied species. This use of the palpi, although abundantly taken up since by all continental araneologists, has never, I believe, been credited to its discoverer as it should have been.

Mr. Blackwall's labours in British Araneology would, doubtless, have become more completely serviceable to students and collectors if he had paid greater attention to the formation of a *collection* of British spiders. His habit was, when new or rare species were found and described, to place the type specimens in "magazine bottles," all mixed together, with perhaps hundreds of others of common species: this rendered it a very tedious matter to hunt out and refer to any particular specimens, besides subjecting them to injury and great liability to loss. Thus, as might be imagined, some unique examples were not forthcoming at all for the illustration of the 'History of British Spiders'; and very many more, placed in the artist's hands for this purpose, were mislaid, and eventually lost and destroyed during the illness of the latter, above referred to. In extenuation of this want of care in preserving his types, it should be remarked that the present very satisfactory method of keeping spiders separated in glass-tubes was unknown at the period of Mr. Blackwall's most active operations, being due to Mr. R. H. Meade in 1852 (see 'Zoologist,' 1852, p. 3676).

It will have been gathered from what has been said that Mr. Blackwall's chief investigations were occupied with *British* spiders; descriptions, however, of numerous *exotic* species are contained in some of the papers above recorded, but these have never been brought into any systematic or connected form.

Although Mr. Blackwall may (without the remotest idea or intention of reproach) be classed among naturalists of the "old school" of thought, yet his mind was of a truly fair and just calibre, and could fully enter into the positions and arguments of the more modern school. It happened to myself to be staying with him in 1860, just after the appearance of Mr. Darwin's work on the 'Origin of Species,' many points in which became the subject of long and frequent discussion between us. Although Mr. Blackwall could not see his way to an acceptance of Mr. Darwin's views, yet their importance as offering a theory for the solution of problems hitherto insoluble on any scientific hypothesis struck him as worthy of the closest attention of every naturalist. His idea, at that time, was that Mr. Darwin's views were more assailable on psychological than on other grounds. He appeared to be impressed with a conviction that if the theory of "natural selection" be a true one, it must be true psychologically as well as physically.

It has been already remarked that Mr. Blackwall's early life was passed in Lancashire; from thence his residence was transferred to North Wales, where, first at Oaklands (about 1832), and afterwards (from about 1854) at Hendre House, near Llanrwst, and not far from the picturesque district of Bettws-y-coed, the remainder of his long life ran out. Although attaining so great an age, Mr. Blackwall was in this respect outdone by his father, who reached the still greater age of ninety-four years.

It should be noted that as lately as 1873 Mr. Blackwall published a second edition of his 'Researches in Zoology'; but, so far as I am aware, the chief difference between this and the first edition consists of the omission of the numerous technical descriptions of spiders, which had become out of place by their incorporation, meanwhile, in his 'History of British Spiders.'

It will be a source of happiness to all who knew him to hear that, although weighed down by great physical prostration, his usual strength and clearness of intellect remained to the last, and the end of the long life, we have been thus very inadequately noticing, came as calmly, quietly, and peacefully, as its many days had passed by. His family and friends have to mourn a good man, and the scientific world a bright ornament.

Mr. Blackwall had been a member of the British Association for the advancement of Science from the commencement, and was at his death very nearly the oldest Fellow of the Linnean Society, having joined it April 17th, 1827.

O. Pickard-Cambridge.

Bloxworth Rectory, near Blandford, Dorset, June 18, 1881.

THE NEW INSECTARIUM AT REGENT'S PARK.

By John T. Carrington, F.L.S.

The Zoological Society is to be congratulated upon its enterprise in establishing, on a large scale, a house to be devoted to the rearing and exhibition of insects during different stages of their metamorphosis. The idea is not quite new, and has been tried in other places with varying success. A few years ago, as a trial, I had a large case constructed, with a number of compartments, for the purpose of rearing insects in this Aquarium. I soon found, however, that we had to contend with two very serious enemies. First were the emanations from the very large quantity of gas used in the building. Some idea of this quantity may be gathered from the fact that gas has cost as much as £190 per week in winter, varying to £60 per week in summer, for illuminating this establishment. Our other trouble was the frequent extremes of temperature. Often just before closing the Aquarium the heat gets up to 85° or 90°, when two hours later the same thermometer will register no more than 40°. Notwithstanding these difficulties many interesting species, both British and exotic, have been successfully reared; but some of our commonest and apparently most hardy Lepidoptera have utterly failed, while others reputedly difficult to rear have come to maturity with little difficulty. One of the most unfortunate has been *Chelonia caja*. Out of many hundreds of larvæ not one per cent. ever came to the imago state, while in the next compartment was its ally, *C. dominula*, every larva of which seemed to produce a moth. It therefore appears that to establish such educational and interesting institutions as Insectaria, the first consideration should be locality and fresh air. In this the Zoological Society has comparatively every advantage.

The elegant conservatory erected on the north bank of the canal which intersects the Society's gardens has the full advantage of any sunlight which may shine in our usually sunless neighbourhood. This light can be controlled by means of blinds, while artificial heat is supplied by hot-water pipes. The building having been specially built for the purpose for which it is intended is oblong in shape, and is provided with stands or tables, upon which rest separate perforated zinc and other cages for rearing lepidopterous and other larvæ. At present there are twenty-six of the former. Twelve of the larger of these are devoted to tropical species of Lepidoptera, chiefly the large silk-producing Bombyces. In the smaller cages may be seen many species of the more familiar British butterflies and moths in various stages of their existence. There are also shown in others foreign examples of some of our rarest species, such as *Catocala fraxini*, &c.

Amongst the species exhibited at the present time are the very beautiful *Samia Gloveri* from Utah, a fine lot of larvæ feeding upon gooseberry. *Attacus Cynthea* and *A. Pernyii* are also feeding in the larval state, the latter species being little under three inches in length. Fine imagines of *Attacus Atlas* have been emerging from pupæ for some time past, as have *A. Luna* and *A. Silene*. *Bombyx Yama-Mai* were occupied in making cocoons and preparing to pupate. This usually difficult species to rear has apparently found its surroundings suited to its welfare, for a nice batch looked in healthy condition. *Saturnia pyri* were just hatching from the ova on the day of my visit, and the little larvæ were evidently satisfied with their commissariat.

Leaving these "silk-producers," and crossing to the European side of the house, may be found *Papilio Machaon*, *Limenitis Sibylla*, *Apatura Iris*, and *A. Ilia*, imagines of which have all been reared from larvæ. Near these are the *Chelonidæ*, which seem to have found more congenial quarters than at Westminster. *Lasiocampa quercifolia* was represented by several large moths. In the next cage were *Cossus ligniperda*, which, after drilling a hole through a piece of willow wood, were comfortably resting in the pupa state.

In the centre of the room is a large table, upon which were placed glass vases, containing aquatic insects; near these were glass tubes and other structures, with various small larvæ and ova of insects. Amongst the former were some interesting larvæ of Neuroptera (dragon-flies). The ant lion larvæ have their pits beautifully made in sand placed in a suitable glass vessel; ants are given to these ferocious little creatures for food. It is interesting to see them throw up the sand, whilst the unfortunate ant falls down the pits, and into the jaws of the adversary. Next these are some very beautiful nests of *Mygale cæmentaria* from Mentone, which have been presented by Mrs. Priestly. A tube contains some larvæ of *Heterogynis penella*, presented by Lord Walsingham, from Monte Carlo. The Trichoptera are represented by several caddis-flies larvæ in their pretty cases.

A good feature of the exhibition is, in many instances, the association of all stages of insects. This is attained by placing a neat little box containing prepared specimens of the remaining transformations of the living examples shown in the cage beneath.

Amongst the orders hitherto represented in this house, Lepidoptera, as might be expected, have held the first place. The larvæ are so much better known, and in many instances more easily managed, that they naturally command the most favour. It is, however, to be hoped, now such an institution has come into existence, the primary object of which is to be educational, that opportunities for studying less worked groups may be extensively afforded. Much more will be learned by visitors seeing living insects, such as ants, bees, &c., at work, than by occasionally reading popular works, or even less trustworthy articles in magazines and newspapers.

It is pleasing to find that the visitors to the Gardens do take an interest in the Insectarium, for it is seldom, during the authorised hours, without visitors, and is frequently unpleasantly crowded.

The new house has been arranged and stocked by Mr. W. Watkins, who has been most successful in rearing various larvæ; and the whole place looks smart, clean, and well cared for. It is curious and amusing to walk after Mr. Watkins as he goes from cage to cage, explaining their contents to the numerous visitors, and to listen to their remarks, some pertinent, whilst others make one feel sad at the dense ignorance of well-dressed and "educated" people.

Royal Aquarium, Westminster, S.W., June 21, 1881.

TORTRIX LAFAURYANA, Ragonot.

A Species New to the British Fauna.

Whilst collecting Micro-lepidoptera a few miles from this town, in July last year, I beat out two specimens of a Tortrix, which I was unable to name. I sent them to Mr. C. G. Barrett, who has kindly informed me that they were male and female *Tortrix Lafauryana*. They were taken in a boggy portion of a heath.

E. A. Atmore.

8, Union Street, King's Lynn, Norfolk,
June 11, 1881.

[We have not seen this species, but, in a contemporary, Mr. C. G. Barrett says:—"*Tortrix Lafauryana* was described by M. Ragonot in the Ann. Soc. Ent. France, 5^{me} série, vol. vi., p. 403 (1876), and also figured. He says that it has been confounded with *Croceana*, Hüb., from which it may be easily distinguished by the costal fold in the male; also that it is allied to *Sorbiana*, forming a passage from it to the species with pale hind wings. His description is long, and it will be sufficient to say that *Lafauryana* has a folded and strongly arched costa, hollowed before the apex, the male resembling *Sorbiana*, but with shorter wings and yellower colouring; the female approaching more in colouring to *Heparana*. The fore wings in both sexes are glossy, and the hind wings of a decidedly *pale* grey. One of Mr. Atmore's specimens agrees most accurately with M. Ragonot's types; the other is redder, and more like the female in colour. The locality given by M. Ragonot is Dax (Landes), France. The larva, which he describes as variable, feeds there on *Myrica Gale*, joining together the terminal leaves, and is very subject to parasites. The species has since been discovered in Holland (*vide* 'Tijdschrift voor Entomologie,' vol. xxii., p. 128)." The proper position in our collections for this important addition to our list is between *Tortrix sorbiana* and *T. rosana*.—Ed.]

COLLECTING IN NORTH DEVON.

By Richard South.

Entomologists who would investigate the insect fauna of North Devon must be prepared to freely exercise their locomotive muscles, for they will have some stiff hills to breast, and for the curiosity of the natives. The first may be dispensed with to a certain extent if they are fortunately in possession of a long purse, for then they can ride to their hunting grounds. The second contingency is a matter not so easily dealt with: the fact of a man wandering along in the hot sunshine with a green bag, or poking about the hedges, ditches, &c., or examining his sugared trees, cannot be reconciled to the mind of the native under any other hypothesis than that the entomologist is "mazed," and as such is regarded accordingly. One good lady imparted the information to her local gossips, in reference to myself, that she "Know'th he be after vearns." The ferns of North Devon are certainly charming, but it would be a simple waste of energy on the one hand, and sweets on the other, to hunt for them with either net or sugar. Another worthy matron, a rural postmistress, whose thirst for knowledge was only excelled by her zeal on behalf of "the property of the postmaster-general," inquired if a small parcel of specimens I wished to be weighed contained cream! As the said parcel was small and under four ounces, the feeling which prompted the query was somewhat evident; so I contented myself by answering in the negative, without stating the nature of contents.

I occupied myself during April and May in "prospecting" the district, and in observing the character of the flora, so that my captures were not numerous. I was only able to work the sallows once or twice towards the end of April. On one of those occasions the bushes were alive with *Scotosia dubitata*, but most of the specimens I examined were faded in colour, though not much worn. A few *Tæniocampa rubricosa*, *T. gracilis*, and one *T. miniosa*, occurred that same evening, together with a host of the commoner species of the genus; also *Eupithecia pumilata*, *E. abbreviata*, and *Lobophora lobulata*. I should state that this was one of the few balmy evenings we had during the month. During May I collected large numbers of larvæ from bilberry and heather, mostly of the Noctuæ group; among them were a few *Agrotis agathina*. The larvæ of *Triphæna fimbria* was abundant, but seemed more partial to the bloom of the wood-sedge or rush (*Luzula sylvatica*).

Most of the hedges in North Devon are formed of beech, with here and there a bush of birch or sallow; others are made of furze, with a sprinkling of hawthorn or broom; but whether of beech or furze, always on the top of a bank of earth faced with stones. This bank is often so covered with heather as to hide the stones; where this is the case, and the hedge itself is of beech, and all in full foliage, the effect is pleasing. About these beech hedges I met with a few *Demas* *coryli*, and a nice series of *Ypsipetes ruberata*, and many commoner inssets. One *D. coryli* in two nights laid 207 eggs, and the fourth night 40 more; and was a good specimen even after having been shut up in a pill-box so long. On the moors occurred *Phycis carbonariella*, where the heath had been burnt in previous years, and a few *Chelonia plantaginis*. When does this insect fly? The examples I took were started out of the heather. I have not observed the time of its voluntary flight. It is said to fly in the sunshine, so it certainly does; but, according to my experience, only under the gentle stimulus of the beating-stick and the approach of danger. In boggy places on the moor among cotton-grass I got some lovely specimens of *Glyphipteryx Haworthella*.

Among butter-burr (*Petasites vulgaris*), in what is locally termed a "water mead," I got *Ephippiphora turbidana*. The locality where I took this insect is very aptly named as regards water, for this was in plenty, though the mead was not quite so evident at first, till I got well though the water; then I got *my* meed in the shape of a good bag of *E. turbidana*. I observed that this species flies between 3 and 4 p.m., but only for a short time; after that they may be found sitting on the upper surface of the leaves, singly and in pairs; during the earlier part of the day it is difficult to get a specimen. *Emmelesia albulata* was abundant in grass meadows; and a few *E. affinitata* were met with in ditches among ragged whin. Sugar did not allure anything good enough to box, with the exception of a few dark forms of *Xylophasia rurea* and one *Dianthœcia cucubali*. I have taken the last-named species at sugar several seasons, but it is the only one of the genus so captured by me. As it is my present intention to remain for the whole coming season in North Devon,.you will probably hear further from me on my captures.

12, Abbey Gardens, St. John's Wood, N.W., June 12, 1881.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Ornithoptera Brookeana, *Wall.* (Description of female).—As I am not aware that this has yet been published, I give it from a very fine example that has just been sent me, captured in Perak, in the Malayan Peninsula:—Expanse (the wings being horizontal and straight) exactly seven inches and a half; my largest male being just seven inches. Form of wings as in male, the black less pure, inclined to smoke-brown: above—fore wings as in male, save that the triangular feather-like spots of metallic green are on the submedian nervure, the three median nervules, and on the posterior side of the second discoidal, but on the anterior side of this last and on both sides of the subcostals the feathers are white, reaching far up towards the cell, and becoming impure towards the points; on the hind wings the central green patch scarcely extends beyond the subcostal, and is further contracted by all the nervules being widely black-bordered; within the cell it gradually becomes of that lustrous blue which marks the under side, and this then gives place to the oblique edge of a triangular patch of deep velvet-black that reaches to the thorax; each of the nervures and nervules is bordered by a spot exactly corresponding to those on the under surface of the male, only, instead of being clear white, of a dingy light brown: beneath—the fore wings differ little from those of male, save that the white submarginal borderings of the nerves are much larger, especially towards the tip, where they even exceed in size those on the upper surface; hind wings exactly as in male, save that the fine blue at the base of the costal is much reduced. Head, thorax and abdomen as in male, save that the crimson of the prothorax is much suffused with black.—P. H. GOSSE; Sandhurst, Torquay, May 6, 1881.

LARVA OF THECLA W-ALBUM.—Is it not unusual to find a larva of the genus *Thecla* cannibalistic? My friend, Mr. Wellman, some three weeks ago kindly gave me half a dozen full-fed larvæ of *Thecla W-album;* and on my arriving home late that evening I found that five out of the six had spun themselves up previous to pupating, being then quite brown in colour. You can imagine my surprise on going the next morning to give the sixth, a green larva, some fresh elm, to find that it had half eaten, and was still apparently enjoying, one of his companions. I should be glad to hear whether any of your correspondents have met with larvæ of this genus being cannibals before.—A. BLISS; 249, Brockley Road, S.E., June 21, 1881.

DEIOPEIA PULCHELLA IN IRELAND.—It will, I think, be of interest to note the capture of a specimen of *D. pulchella,* which I took on September 7th, 1880, in the vicinity of Ardmore, on the

Waterford coast. It is, as far as I can make out, the first notice of its occurrence in Ireland. I found the moth in a field a few hundred yards from the cliff, and was ignorant till recently of its rarity. It only measures 1 inch 4 lines in the expanse of its fore wings, but there can be no doubt as to the species.—C. B. USSHER; The College, Marlborough, June 7, 1881.

ABUNDANCE OF LITHOSIA RUBRICOLLIS.—From June 12th up to the present date *Lithosia rubricollis* has simply swarmed in a wood near here. They were to be taken, freshly emerged from pupæ, at rest on the ferns in any numbers. They were also to be seen flying round the tops of some fir trees in "myriads." Is not this an unusual occurrence?—J. H. LEECH; St. Paul's Vicarage, Shanklin, Isle of Wight, June 22, 1881.

LEPIDOPTERA AT WICKEN FEN.—We understand that so far the captures of Lepidoptera during the present season have been below the average in the Wicken district. On two or three warm still nights a fair number of *Meliana flammea*, with a few *Macrogaster arundinis*, have been taken at light. *Nascia cilialis* appears this year to be scarce; while the larvæ of *Orgyia cœnosa* has not appeared.—JOHN T. CARRINGTON; June 20, 1881.

ACRONYCTA ALNI AND STAUROPUS FAGI.—On May 28th I bred a fine specimen of *Acronycta alni*, and on the 30th another equally good. From June 2nd to the 6th six *Stauropus fagi* emerged, two of which were unfortunately crippled. These were the produce of eggs which I obtained from a female taken by me on the 10th July last year. Insects appear to be unusually abundant down here this season.—E. H. JONES; Queen's Lodge, Lyndhurst, June 23, 1881.

BREEDING RARE LEPIDOPTERA.—I have much pleasure in recording the successful breeding of three *Acronycta alni* from larvæ taken in the New Forest last autumn; also two *Limacodes asellus*, a nice series of *Notodonta chaonia*, *Cymatophora ridens*, *Diphthera Orion*, and a magnificent series of *Stauropus fagi*, the latter reared from eggs; and I may say I have been so far successful in hybernating the larvæ of *Apatura Iris*.—J. W. JOBSON; 4, Hope Villa, Capworth Street, Leyton, Essex, June, 1881.

FURTHER NOTES ON BREEDING ACIDALIA OCHRATA.—In the last volume of the 'Entomologist' (Entom. xiii. 306), I described the larva of this very local *Acidalia*. The description was made from abnormally forced larvæ; but the remaining portion of the brood, that had been fed out of doors, hybernated when quite small. They did not move or feed all the winter, but remained attached in a slightly bent position to the dried roots and stems of grass until April, when a few warm days tempted them to move. As the forced larvæ had done well on the flowers of various *Compositæ*, I first tried to tempt them with the flowers of coltsfoot (*Tussilago farfara*). This they nibbled at times during April, and by the end of the month *Taraxacum* flowers and leaves were added to their bill of fare. During May the withered and nearly dry food was slightly wetted twice a week by means of a glass-spray producer; this gentle bath seemed to suit them admirably. The idea was suggested to my mind by knowing that in their natural habitat they would be subject to frequent fog and moisture. At any rate it succeeded well, and by the middle of June all had spun their flimsy cocoons amongst the food-plant. The hybernated larvæ did not vary or differ from the forced examples; perhaps a trifle larger. I shall in all probability have eggs for friends by the third week in July.—W. H. TUGWELL; 3, Lewisham Road, Greenwich.

DICRORAMPHA FLAVIDORSANA, (?) *Knaggs.*—Towards the end of last month, whilst working the rocks on the North Devon coast in search of the pupæ of *Sesia muscæformis*, of which by the way I only got one living pupa and plenty of old cases, I netted three examples of a species of *Dicrorampha*. I saw many others, but, from the nature of the situation, was unable to capture any more at that time. Since then I have taken a few nearly every day, and have also bred a few from pupæ found in the root-stocks of *Chrysanthemum leucanthemum* and *Matricaria inodra* var. *salina;* but only one from the last-named plant. I have not specimens of either *D. politana* or *D. alpinana* with which to compare my insects, but from their large size, dark olive-brown ground colour, and bright dorsal and apical orange markings, they seem to me to be distinct from either, and to agree with the *D. flavidorsana* of Dr. Knaggs, except in the size. Then, again, the pupæ being found in the ox-eye daisy and the other allied plant, and the burrows noticed down the stem, is strong presumptive evidence of the larva having fed in those plants; this in itself does not prove a question of species, but I consider it an important item. I did not observe *Achillea*, and tansy certainly does not grow on or anywhere near the spot. Ox-eye grows on the top of the cliffs and in fields, but little distant therefrom, but this particular insect does not occur among the plant there. It seems confined to a particular space of rugged rock, where there is here and there just sufficient earth for a few plants of the species named to flourish, together with such others as are usually found in similar localities, as *Silene maritima*, *Statice*, &c. I noticed a female settle on the under side of a flower of ox-eye, but I could not get at that blossom to see if she had deposited eggs. The perfect insects are on the wing from 2 p.m. till 4 p.m., not continuously, but at intervals; did not observe it either before or after those hours.—RICHARD SOUTH; 12, Abbey Gardens, N.W., June 12, 1881.

COLEOPHORA INFLATELLA.—I have succeeded in breeding a nice long series of *Coleophora inflatella* from larvæ gathered on the south-east coast.—C. J. BODEN; 153, Snowsfields, Southwark, June 17, 1881.

CLOSTERA ANACHORETA.—In the 'Entomologist' for 1876, vol. ix., p. 232, will be found a notice to the readers of that journal that I had discovered the pupa of *Clostera anachoreta* whilst at Deal. I beg to state, for the Rev. J. Green's information and others, that the pupa was found behind the loose bark of a pollard willow, no poplar being near.—S. NORMAN; Dartmouth Castle, South Devon.

LEPIDOPTERA ATTRACTED BY ELECTRIC LIGHT.—Whilst passing through the city on Saturday night I noticed Lepidoptera flying round the three high electric lights placed near the Mansion House at the corner of Cheapside, King William Street, and Cornhill; and also round the two lower lights, one at each end of the Royal Exchange. On one of the latter I saw three moths at the same time, and on the other there were two. Considering the little vegetation about that part of the city, I should think the moths must have been attracted from some considerable distance. It is needless to say it was impossible to detect the species.—A. W. MERA; 195, The Grove, Hammersmith, June 23, 1881.

[Last Sunday evening, June 26th, I observed moths flying round nearly all the electric lights on Waterloo Bridge. One moth which fell upon the pavement was *Arctia menthastri*, and I have no doubt the others were of the same species. Our correspondent forgets that within the precincts of the Bank of England is sufficient vegetation to support a large number of larvæ. The Embankment gardens, no doubt, supplied those moths I saw.—J. T. C.]

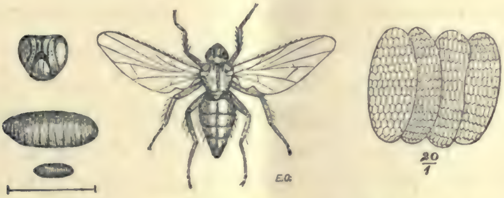
SIR JOHN LUBBOCK ON THE HABITS OF ANTS.—On Thursday, 2nd June, Sir John Lubbock read a further paper on this subject at the meeting of the Linnean Society. He said that in one of of his former papers (Linnean Society Journ., vol. xiv. p. 278), he had given a series of experiments made on ants with light of different colours, in order, if possible, to determine whether ants had the power of distinguishing different colours. For this purpose he utilised the dread which ants when on their nest have of light. Not unnaturally, if a nest is uncovered, they think they are being attacked, and hasten to carry their young away to a darker, and as they suppose a safer, place. He satisfied himself by hundreds of experiments that if he exposed to light most of a nest, but left any part of it covered over, the young would certainly be conveyed to the dark portion. In this manner he satisfied himself that the different rays of the spectrum act on them in a different manner from that in which they affect us; for instance, that ants are specially sensitive to the violet rays. But he was anxious to go beyond this, and to attempt to determine how far their limits of vision agree with ours. We all know that if a ray of white light is passed through a prism, it is broken up into a beautiful band of colours—the spectrum. To our eyes it is bounded by red at the one end and violet at the other, the edge being sharply marked at the red end, but less abruptly at the violet. But a ray of light contains, besides the rays visible to our eyes, others which are called, though not with absolute correctness, heat rays and chemical rays. These, so far from being bounded by the limits of our vision, extend far beyond it, the heat rays at the red, the chemical rays at the violet end. He wished under these circumstances to determine, if possible, whether the limits of vision in the case of ants was the same as with us. This interesting problem he endeavoured to solve as follows:—If an ant's nest be disturbed, the ants soon carry their grubs and chrysalises underground again to a place of safety. Sir John, availing himself of this habit, placed some ants with larvæ and pupæ between two plates of glass about one-eighth of an inch, a distance which leaves just room enough for the ants to move about freely. He found that if he covered over part of the glass with any opaque substance, the young were always carried into the part thus darkened. He then tried placing over the nest different coloured glasess, and found that if he placed side by side a pale yellow glass and one of deep violet, the young were always carried under the former, showing that though the light yellow was much more transparent to our eyes, it was, on the contrary, much less so to the ants. So far he had gone in experiments already recorded. But he now wished, as already mentioned, to go further, and test the effect upon them of the ultra-violet rays, which to us are invisible. For this purpose, among other experiments, he used a solution of sulphate of quinine and bisulphide of carbon, both of which transmit all the visible rays, and are therefore perfectly colourless and transparent to us, but which completely stop the ultra-violet rays. Over a part of one of his nests he placed flat-sided bottles containing the above-mentioned fluids, and over another part a piece of dark violet glass; in every case the larvæ were carried under the transparent liquids, and not under the violet glass. Again, he threw a spectrum into a similar nest, and found that if the ants had to choose between placing their young in the ultra-violet rays or in the red, they preferred the latter. He infers, therefore, that the ants perceive the ultra-violet rays, which to our eyes are quite invisible. Now as every ray of homogeneous light which we can perceive at all appears to us a distinct colour, it seems probable that these ultra-violet rays must make themselves apparent to the ants as a distinct and separate colour (of which we can form no idea), but as unlike the rest as red is from yellow, or green from violet. The question also arises whether white light to these insects would differ from our white light in containing this additional colour. At any rate, as few of the colours in nature are pure colours, but almost all arise from the combination of rays of different wave-lengths, and as in such cases the visible resultant would be composed not only of the rays which we see, but of these and the ultra-violet it would appear that the colours of objects and the general aspect of nature must present to them a very different appearance from what it does to us. Similar experiments which Sir John also made with some of the lower Crustacea points to the same conclusion, but the account of these he reserved to a future occasion. He then proceeded to describe some experiments made on the sense of direction possessed by ants, but it would not be easy to make these intelligible without figures. After detailing some further experiments on the power of recognising friends, he gave some facts which appear to show that ants by selection of food can produce either a queen or a worker at will from a given egg. Lastly, he stated that he had still some ants which he had commenced to observe in 1874, and which are still living and in perfect health; they now, therefore, must be more than seven years old, being, therefore, by far the oldest insects on record.—*Communicated by the Secretary.*

DOLERUS PALUSTRIS BRED.—It is curious that until last year the life-history of the *Doleridæ* was quite unknown, although we have fifty-seven European species, many of which are amongst our very commonest sunflies. In 1880 Vollenhoven's description of the larva of *D. hæmatodes*, Schk., was posthumously published (Tijd. v. Ent. xxxiii., 14—16). This feeds on *Juncus effusus.* Kaltenbach bred *D. gonager*, Fabr., from *Festuca pratensis*, but gave no life-history notes nor description of larva ('Pflanzenfeinde,' p. 746). For some years I have found a sawfly larva feeding inside the stems of *Equisetum*, which I strongly suspected to belong to a *Dolerus;* but several, not very determined, attempts at rearing the imagos had failed. Last year I collected some scores of the larvæ, and kept them in three large cages. The contents of that kept damp very soon became quite rotten and useless; in that kept dry the food-plant and larvæ very soon dried up; but the cage in which the *Equisetum* was slightly damped, through the addition of fresh stems from time to time, it became very mouldy; here I had hopes, and from this store am now breeding imagos of *Dolerus palustris*, Klg. A male and female emerged yesterday, and two males the day before. The larva is roughly described in my diary as follows:—Form as in Vollenhoven's figure (Tijd. v. Ent., vol. xxxiii., pl. 3, bottom), with six legs and sixteen claspers, including the anal pair; head dark brown, with pale oval mark on face; body wrinkled, greenish slate dorsally, glaucous ventrally; dorsal line slightly darker than general ground colour; spiracular lines greenish yellow, in which are the black inconspicuous spiracles; length, three-quarters of an inch. It feeds inside the stems of *Equisetum limosum*, not eating through the nodes, but apparently coming out at the end, and biting into the next division, just above the joint; generally, however, there is but one hole between the joints, and this mostly at the base, so probably the larva exits at the entrance-hole. It pupates in the ground, and, as is general in the *Tenthredinidæ*, the larva enters it in the autumn but does not become a pupa until the following spring. My specimens hybernated in little earthen cells quite at the bottom of the cage, which contained about six inches of earth. A small percentage only turned to light yellowish-brown pupæ in the earthen cells. I could discover no trace of silk, or anything worthy of the name of a cocoon.—Edward A. Fitch; Maldon, Essex, April 27, 1881.

The Mangold-fly.—The mangold crops in this neighbourhood are again seriously threatened by the attacks of the "mangold-fly," which, commencing its work of devastation this year upon the plants whilst much smaller than in 1880, may, I fear, result in an almost total failure of this important crop in the infested districts. Mr. E. A. Fitch, in his exhaustive economic article upon this species (Entom. xiv., 8, 25), says that no practical remedy can be given until more is known of its special habits. Probably since then many entomologists, thus having their attention particularly drawn to it, will have made observations of practical utility in the matter of pointing out or proving an efficient remedy. It would be a valuable contribution to our knowledge if any who are in this position could give instructions that would tend either to totally or partially alleviate the losses caused by this pest?—Wm. E. Brady; 1, Queen Street, Barnsley, June 20, 1881.

[This fly is again rampant. Many of the crop reports in the agricultural journals refer to it. The following from North Notts, in the 'Chamber of Agriculture Journal,' is the most explicit I have met with. "If the plague of flies in the land of Egypt was as troublesome in general as the mangel wurtzel fly is to my mangels, I can understand Pharoah entreating that they might be removed. I suppose Pharoah never had a nicer lot of mangels than I had at the end of May—side hoed, horse hoed, cut out, and singled; then came the flies. A little brown fly, somewhat like a horsefly, but not so large, laid numberless eggs on the underside of the leaves. I have counted more than 100 on a leaf—some hatched, and ten or eleven maggots may be found in a leaf devouring the substance between the upper and under skins, the leaf then withers as if frost-bitten. On one field I spread fresh-slaked lime whilst the dew was on, beginning about four a.m., but the pests are still there. On another piece I sprinkled diluted fir tree oil, such as gardeners and nurserymen use, but that was too costly, and to-day I have dusted nine acres, plant by plant, with a mixture of fresh soot, fresh-slaked lime, and flour of sulphur; and one of the boys said between the sneezes, 'If this does not kill them I don't know what will'" (W. P. J. A). This week I have seen many young plants here (Maldon) quite whitened from its attack. Mangolds generally are a very thin and late plant on our heavy land, and from the continued drought are very slow growing; these larvæ feeding on the leaf-substance may be calculated to cause material loss of crop.—E. A. F.]

ANTHOMYIA BETÆ (the Mangold-fly).—Great injury from attacks of the larvæ of the *Anthomyia betæ* is of such very recent occurrence in this country, that as yet the only point that can fairly be grasped with certainty as a remedy is any kind of treatment that will encourage a quick and healthy growth, and thus enable the plant to counterbalance by rapid formation of leafage the amount which is gnawed away by the larvæ. As far as we see at present the larvæ feed for about a month in the leaves, and then turn to pupæ, and two or possibly more broods occur during the season, but the later brood is not so injurious as that of the early summer, the leaves being then larger and better fitted to bear attack. A dressing of some kind of manure which will wash down to the roots on the first shower, and thus be immediately available, is the best remedy of which we have information at present. Guano has been found serviceable, and so has the application of soot; but mineral superphosphate is the most



Beet- or Mangold-fly, ♀ mag., line showing spread of wings, nat. size. Head, mag. Pupa, nat. size and magnified. Eggs (after Farsky), mag.

useful that has yet been noted. Where agricultural arrangements are such (as in some parts of the Lothians) as to allow of watering at *remunerative rate*, this is a great help in times of passing drought, both by preventing the plant flagging, and giving it the benefit of manure in the soil, or specially supplied. Whether any dressing can be applied to prevent oviposition by the fly remains to be seen (and it is much to be hoped that those who experiment will give us the benefit of their experience); but, looking at the dislike of insects to sulphur, it is probable that the application of this would be useful, whether as a dressing which may be given at the rate of 14lb. per acre mixed (a few days before use) with a bushel of fresh lime, and two bushels of road scraping, or in the form of a sprinkling of gas-lime which has been exposed to atmospheric action for six months or so, and thus become a safe as well as serviceable application. Experiment in the present season has shown this to be of great use as a means of prevention of attack of the so-called turnip "fly," and though the Coleoptera and Diptera are widely apart in their natures there is much similarity in some of the points of these two kinds of attack, and the application is worth a trial. Looking also at the great attraction of animal excreta to many of the Diptera, the observation of the bad attack of the beet fly occurring for a second time on a sewage farm is worth remarking, and further notes on any matter bearing on prevention would be of general service.—E. A. ORMEROD; Dunster Lodge, Isleworth.

AN INSECT PLAGUE.—Our Preston correspondent states, "A great plague of insects, unequalled in Lancashire for many years, is visiting the agricultural districts in the neighbourhood of Clitheroe. The insects come in dense clouds, and the houses and country literally swarm with them; they eat up the grass and almost everything green. To-day (Thursday) they have passed towards Chipping, and it is reported that a whole field has been eaten bare."—'Daily Telegraph,' June 17, 1881.

[Having applied to our obliging correspondent, Mr. J. B. Hodgkinson, of Preston, for particulars about this so-called insect plague, he has favoured us with the following facts:—"In reply to your enquiry, I have to state that the caterpillars which have caused so much sensation in this district are those of *Charæas graminis*. I have personally had several opportunities of verifying the extraordinary abundance of these larvæ. One of my most trustworthy friends tells me that last Whit-Monday he had taken shelter from rain in a quarry; and while there observed these larvæ dropping over a ledge of rock into a hole beneath. Such were the immense numbers, that the hole from which they could not extricate themselves had the appearance of a seething cauldron of living creatures. No doubt a great deal of exaggeration has gone forth through the newspapers and otherwise, but, nevertheless, the phenomenon is really very extraordinary in its character. During the last two years I have had a country house in the infected district, so that I have had many opportunities of observing the habits of *C. graminis*, had they been there in unusual numbers. I may safely say I did not see two dozen specimens during the two seasons. These came to my light, which I had placed to attract insects. I find that the usual time of flight for this species is from seven to eight o'clock in the morning, when entomologists are usually enjoying their well-earned repose, after the night's work." The late Mr. Edward Newman, in his 'History of British Moths,' at page 293, says of *Charæas graminis*:—"The caterpillar has always been notorious for the injuries it causes in grass lands. Linnæus emphatically says, 'This is the most destructive of our Swedish caterpillars, laying waste our meadows and annihilating the crop of hay.' In the years 1741 and 1778 its ravages were so great as to amount to a national calamity. . . . . . Some authors have asserted that it spares the species of the genus *Alopecurus*, and others those of the genus *Trifolium*, but these assertions are not published on authority sufficiently reliable." It would be an interesting addition to our knowledge of Economic Entomology if Mr. Hodgkinson and other observers would find out what plants are most affected by these larvæ. At p. 200 of vol. i. of the 'Entomological Magazine,' Mr. George Wailes, writing in 1832, says of the damage done by this species of larvæ that "some years ago (in 1824 I believe), during the spring and early summer the herbage of a large portion of the level part of Skiddaw, . . . comprising at least fifty acres . . . . . was observed, even from the town of Keswick, to assume a dry and parched appearance; and so marked was the line that the progress made by the larvæ down the mountain could be distinctly noted." Mr. Wailes also refers to the habits of the imagines flying about eight o'clock in the morning, giving a graphic account of the abundance of the moths.—J T. C.]

CATERPILLARS STOPPING A RAILWAY TRAIN.—"To say that a train had been stopped by caterpillars would sound like a Yankee yarn, yet such a thing (according to the 'Rangitikei Advocate') actually took place on the local railway a few days ago. In the neighbourhood of Turakina, New Zealand, an army of caterpillars, hundreds of thousands strong, was marching across the line, bound for a new field of oats, when the train came along. Thousands of the creeping vermin were crushed by the wheels of the engine, and suddenly the train came to a dead stop. On examination it was found that the wheels of the engine had become so greasy that they kept on revolving without advancing—they could not grip the rails. The guard and the engine-driver procured sand and strewed it on the rails, and the engine made a fresh start; but it was found that during the stoppage caterpillars in thousands had crawled all over the engine, and over all the carriages inside and out."—'COLONIES AND INDIA.'

NOTICE OF NEW BOOK.

A Manual of Injurious Insects. By E. A. ORMEROD, F.M.S., &c.
London: W. Swan Sonnenschein & Allen. 1881.

EVERYONE interested in agriculture or floriculture should get this work, and, once having it, will wonder how he got along without it. It gives concise descriptions, with many figures, of such insect enemies as we have in our gardens and fields, with suggestions for the best methods of prevention, and the remedies for their attacks.

We first find a short introduction to Entomology; the different orders being illustrated with a familiar type species, showing figures of imago, larvæ, pupæ, &c. The work is then divided into three parts, Part I. being on "Food Crops, and the insects that injure them;" Part II. "On Forest Trees, and the insects that injure them;" and Part III. relates to "Fruit Crops." Lastly is a useful glossary of technical and other terms used in the book. A more extended notice will appear in another number, but, in the meantime, a more useful present will not be found for the village school library or our country cousin.

The work is popularly written, and is unencumbered with unnecessary scientific terms, and so brings the subject within the power of the least initiated.—J. T. C.

THE ENTOMOLOGIST.

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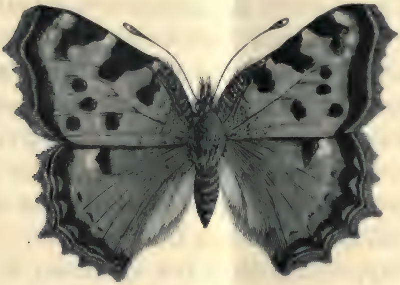
IS *VANESSA POLYCHLOROS* THE PROTOTYPE OF *V. URTICÆ?*

A Query suggested by the Aberrant Form of a Specimen of *V. Urticæ* of *Polychloros* type.*

By William White.



V. Urticæ of Polychloros type.

The caterpillar of the *Vanessa* exhibited was taken at Highgate Hill in 1879, included in the larval "web" of a community of *Urticæ*, and was reared throughout its existence with the rest of the brood entirely upon nettle (*Urtica*). During the larval stage there was nothing noticeable in its appearance to distinguish it in any way from its companions. In the chrysalis form it bore the specific characters of *Urticæ* as regards its angular projections and general contour, but the colours were somewhat richer in tone than is usual, sufficiently so to attract special notice. The imago is rather below the average measure of *Polychloros* in expanse of wings, being about the usual size of *Urticæ* (two inches). The insect is the only individual of the brood known to have varied, even in the slightest degree. Although I did not see every member of the brood, I can vouch for at least forty or fifty specimens, which I examined carefully, and found not a trace of variation in any single case. No larvæ of any other species of *Vanessidæ* were reared contemporaneously with the brood.

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* Extracted from the 'Transactions of the Epping Forest and County of Essex Naturalists' Field Club.'

I have examined the antennæ of this specimen under the microscope, and find that they present the special characters found in *Polychloros*.

From these facts I make four deductions, all of which turn upon points of interest. It is from such instances of divergence as the present that we are enabled to gain some clue respecting the affinity of species known to be closely related, and for this reason I offer the following observations :—

1. As *Polychloros* lives upon elm and other trees, and *Urticæ* upon nettle and low plants, the instance is valuable as affording further evidence of the fact that neither a particular food nor a change in diet affects in any way the colouring and markings of the perfect insect, so as to offer *per se* a means of originating "varieties." This conclusion is valid whether the specimen under consideration be really a *Polychloros* or *Urticæ*. Many experiments upon different species of insects agree, I believe without exception, in so deciding this question.

2. On the supposition that the specimen is the product of *Polychloros* parents, it is easy to infer either that the ovum was dropped whilst the female was on the wing, or else that the young caterpillar fell from a neighbouring tree soon after emergence from the egg; in either case the accident must have occurred immediately over the *Urticæ* web. As the broods of the two species rarely appear synchronously, the conjecture is scarcely to be entertained, even if the accident were probable. On such a supposition, however, it is to be deduced that (if *Polychloros*) the society of an allied species does not affect the development of the individual, but such individuals are treated as friends. It is to be remembered, at the same time, that the larva of *Urticæ* bears a much closer resemblance to *Pyrameis Cardui* than to *Polychloros* [specimens of larvæ (preserved) were exhibited for the sake of comparison.]

3. If it happen to be a hybrid* between the two species, it offers an instance of the fact which has been proved by Darwin and others, that in the case of hybrids between closely-allied forms the progeny, instead of assuming direct intermediate characters, inherits the characters of one or other of its parents; and that in numerical proportions varying with the circumstances. As my specimen is the only known individual of the swarm the theory is rather a lame one.

4. Lastly, on the understanding that the specimen is the development of an *Urticæ* larva, we must conclude that it is *a case of recurrence to a previous form, and, if so, that form was Polychloros;* that, while *Polychloros* has not changed, the change of habitat and environment has brought about the marked variety which now constitutes a separate species in *Urticæ*. In favour of this supposition I may instance the well-known fact that *V. Urticæ*,† like *V. C-Album* and *P. Cardui*, varies occasionally in colour, markings, and size, whilst *Polychloros* is much more persistent—indeed almost invariable—in type, though irregular in point of size. The latter variability, however, is common to all classes of animals at any given period.

This persistency of type argues an antiquity beyond that of its allies, and makes it appear highly probable that *V. Polychloros* is the ancestral prototype of *V. Urticæ*.

[In connection with Mr. White's paper, it may be interesting to quote the following record of a similar experience given in the 'Entomologist,' vi. 88:—"In the spring of last year I took the larvæ of what I considered to be *V. Urticæ* feeding on nettles, and from time to time added other larvæ of *Urticæ* in the same breeding-cage kept for nettle-feeders only; to my surprise a number of the imagos resembled *Polychloros* in colour and markings, keeping the size of *Urticæ*. I submit them to you for your remarks. There was no apparent difference in the larvæ that I observed while feeding.—JAMES A. TAWELL; Earl's Colne, March 11th, 1872." The late Mr. Newman headed this note "*Polychloros* Larvæ feeding on Nettle," and described the butterflies as follows:—"These specimens have a wonderful similarity to *Urticæ*, which they do not at all exceed in size; still the colour is nearer to that of *Polychloros* than that of *Urticæ*; and the black spot at the anal angle of the fore wing is present, as in *Polychloros;* the white spot on the costa of *Urticæ* is absent, also as in *Polychloros*." Some of these specimens were presented to Mr. Newman, and, as we are informed by Mr. B. T. Lowne, are now in the collection of the Entomological Club.—Ed.]

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* [The Rev. G. H. Raynor records ('Entomologist,' vi. 221) finding a specimen of *V. Urticæ in coitu* with *V. Polychloros*.—ED. TRANS.]

† Newman, in his 'British Butterflies,' gives woodcuts of four aberrations of *Urticæ*, but not one of *Polychloros;* nor does he instance any variation in the latter species.

During the discussion which followed the paper the President, Mr. Raphael Meldola, stated that Mr. White's query was, in his opinion, very suggestive, but he was disposed to think that it was hardly based upon a sufficiently broad view of the true state of affairs with respect to the genus under consideration.

The facts are that our native "Tortoiseshells" are representatives of a genus comprising about two dozen or more species ranging throughout Europe, Asia, and North and South America; or, in other words, throughout the greater portion of the Palæarctic, Nearctic, Neotropical, and Oriental zoological regions. Now *V. Polychloros* and *V. Urticæ* are two of a group of species more or less resembling them in colour and marking, this group being linked by a large number of intermediate forms with our *C-album* or "Comma" butterfly. He had thought the matter of sufficient interest to draw up the following list of species, showing the transition in question:—

V. C-album	Europe, N. and W. Asia.
V. I-album	Asia Minor, S. Europe.
V. V-album	Asia Minor, S. Europe.
V. Californica	California.
V. Polychloros.........	Europe, Asia.
V. Xanthomelas	E. Europe, N. India.
V. Cashmirensis	N. India.
V. Urticæ	Europe, W. Asia.
V. Milberti	S. America.

These were only a few of the more striking transitional forms selected for the purpose of illustrating the argument.

In the language of evolution we should therefore say that the genus *Vanessa* was in a very complete state of phyletic preservation, *i.e.*, all the species having diverged from a common ancestor, the various steps in the process of divergence, instead of having become extinct and leaving large gaps between the species, as so frequently happens, have been more or less preserved down to the present time. *Polychloros, Xanthomelas, Urticæ*, &c., are thus true blood-relations, and, in accordance with the laws of heredity, it is not therefore surprising, although extremely interesting, that we should find one of these species occasionally giving rise to a variety resembling an allied form. If, therefore, Mr. White means to ask whether *Polychloros* is the progenitor of *Urticæ* on the strength of his having obtained a variety of the latter resembling the former, he (the President) would be inclined to answer that the two species under consideration, with their congeneric forms, had all descended from a common ancestor, and that the variety in question was a case of reversion to this ancestral type.

In illustration of the foregoing remarks the President exhibited specimens of *Urticæ* and *Polychloros*, with the intermediate North Indian *V. Cashmirensis*, and, as a parallel case, *Pyrameis Atalanta* and *Cardui*, with the intermediate *P. Callirhoë*, likewise from N. India.

Mr. A. G. Butler, F.L.S., F.Z.S., of the Zoological Department, British Museum, has kindly furnished the Editor of the Transactions with the following valuable observations on the above:—

"I have read Mr. White's paper carefully through, and I must say that I perfectly agree with Mr. Meldola.

"The fact that the larva of *V. Polychloros* feeds upon elm, whereas that of *V. Urticæ* feeds upon nettle, would naturally lead me to look for a mutual progenitor of these and the numerous allied species whose larvæ should feed indiscriminately upon either the tree or the weed; this we find in *V. C-Album;* therefore it is more probable that the group to which the latter species belongs is the parent of both *V. Polychloros* and *V. Urticæ* than that the latter should be derived from the former.

"The different races, or perhaps seasonal forms, of *V. C-Album* show considerable modifications in the outline of the wing; and an examination of foreign species shows that these modifications may readily become permanent.

"I do not admit Mr. White's statement that food does not produce variation. I have very little doubt, if he will try the same experiment that I have done, his conviction will be seriously shaken. Some years since my friend, Mr. Herbert Gosse, reared a number of singularly dark varieties of *Odonestis potatoria*, and the only explanation for this burst of melanism which he could suggest was, that he had been reckless as to the species of grass upon which he fed the larvæ. He subsequently sent me some larvæ, which I fed upon different grass every day, with the result that I did not rear a single typical example, all being melanic and much dwarfed. When I gave up collecting our British moths some years since I got rid of my specimens with the exception of a single pair, which are now in the general collection at the British Museum.

"Mr. White says that his *V. Urticæ* is of the usual size, but with the characters of *Polychloros;* this description would answer very well for *V. Californica*, and, considering the great general resemblance between all the species of the group, the case is not a very remarkable instance of reversion.

"In a brood of about fifty *V. Urticæ*, reared by me, there was a single very dark and small specimen which, although not like *V. Polychloros*, may have been a case of reversion to something more nearly allied to *V. C-album;* and some of the species allied to the latter are very dark indeed.

"Lastly, as about half the species in the genus have the wings far more deeply dentated and subcaudate than the other half, whilst many gradations between the extremes of these two types exist, it seems most natural to look for the progenitor in a species which exhibits variation of form in accordance with the season, so that one may account for the prevalence of one type in one climate and of the other in another; and to regard two species of the same type as descended one from the other, especially when these two co-exist throughout Europe (or nearly so), seems to me to be a supposition in the highest degree improbable."

INTRODUCTORY PAPERS ON LEPIDOPTERA.

By W. F. Kirby,

Assistant in the Zoological Department, British Museum.

No. XVII. NYMPHALIDÆ—NYMPHALINÆ (*continued*).

There are several genera allied to *Hypolimnas*, all Indian or African, which are chiefly remarkable for their resemblance to species of *Danaus* or *Acræa*. The former are Indian; and two species will serve to illustrate them. One is *Hestina assimilis*, a black butterfly expanding about four inches, streaked with pale green as in the green *Danai*, from which, however, it may be instantly distinguished by a row of five moderate-sized submarginal red spots on the hind wings. *Penthema Lisarda*, a rarer species from North India, expands over five inches, and is one of the largest of the Indian *Nymphalidæ*. It is black, with buff streaks towards the base, and two rows of moderate-sized spots towards the hind margins of all the wings. The Indian species resembling *Danai* have all more distinctly dentated wings than in the genus *Danaus*, but some of the African species of the genus *Pseudacræa* so closely resemble those of the *Planema* group of *Acræa* that they can scarcely be distinguished from them except by structural characters, of which the most salient is the greater abruptness of the club of the antennæ. There are also species of *Papilio* which mimic *Danainæ*, *Acræinæ*, or the genera allied to *Hypolimnas*; but these, of course, may be distinguished at once by their six walking legs.

The genus *Euxanthe* includes a few large and handsome African species, with broad fore wings, which are short, and hardly pointed at the tips. *E. Eurinome* expands about three inches and a half, and is black, with a green spot in the cell, an irregular row of long green spots beyond, then a shorter row of smaller ones, and a submarginal row. The hind wings are green at the base, the colour being irregularly divided on the outside by the nervures; and there is a row of moderately large spots between this and the submarginal row of small ones.

Some of the East Indian genera allied to *Hypolimnas* have slightly dentated wings, with the hind wings more or less rectangular. The largest and handsomest of these belong to the genus *Parthenos*. The species expand about three or four inches; the wings are adorned with bluish or greenish markings on a black ground, which are straight towards the base, and festooned or sagittate beyond the middle; the fore wings are crossed by a transverse band of large white spots, and there are several others in the cell.

Euripus Halitherses is a smaller insect averaging from two inches and a half to three inches in expanse, common in India, and black, with longitudinal buff markings towards the base of the fore wings, and a double row of spots beyond. The hind wings are irregularly dentated, with a blunt projection in the middle of the hind margin: the radiating buff stripes cover three-fourths of the base of the wing, and there are two rows of small bluish or greenish marginal dots, arranged in pairs. The female has longer, almost entire, wings, and resembles a small *Euplœa*, being brown, with radiating white stripes on the basal third of the fore wings, and a row of small marginal double white spots. There is a white band, divided into long spots, running from the costa of the fore wings at about two-thirds of their length.

ON THE DEVELOPMENT OF THE PUPA OF *ARCTIA CAJA*.

By Edward Lovett.

Upon visiting a batch of larvæ of *Arctia caja*, which I am rearing, I observed through the thin cocoon that one was on the point of exuviating its larval skin, which had split vertically across the head and down between the prolegs, exposing the enclosed pupa. I immediately transferred the specimen to a tube of alcohol, but not before it had quite freed itself from the larval epidermis.

At this stage of its development the pupa is almost white and very soft, and by preserving it in this way I was enabled to arrest its development at this point. The immature pupa is most remarkable, for its whole appearance corresponds to that of a newly-emerged moth, except in point of colour, or rather scale development. Instead of the usual pupal form, the head, eyes, antennæ, legs and wings are *perfectly free*, as in the case of the imago, whilst the lower portion of the pupa constitutes the body, the anal orifice of which is quite conspicuous.

Upon examination under the microscope I was unable to trace the slightest scale development, but all the limbs had a fleshy, structureless appearance, giving the general idea of a fœtus. The wings, however, exhibited numerous vessels ramifying over the whole surface.

I am inclined to think, from the examination of this specimen, that upon the exuviation of the larval skin the pupa is practically developed into the moth, and that an exudation of a material, somewhat analogous to *lac*, takes place. This, on exposure, hardens into what we know as the pupal skin or pupa-case, and binds the limbs of the future moth into place. It is then that these already formed limbs complete their development, and become clothed with scales. It will also be more easily understood how cripples occur, for if the limbs, whilst in their free state, should by any accident become slightly misplaced, contorted, or maimed, they would become cemented in that condition by the hardening over them of the exuded "lac." Therefore it is probable that the setting of the pupa-case is the most critical point in the insect's existence.

As there was no trace whatever of scales, as such it would be interesting to know how and when their development took place, and to what causes variations in their form of colour and arrangement may be attributed. It would appear probable that, "*cetera paribus*," the effect of light upon the exposed surface of the rapidly maturing wings would cause certain results as to colour.

Holly Mount, Croydon, July 2, 1881.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

THECLA W-ALBUM.—As one of the founders of the South London Entomological Society, I am surprised to find the secretary not knowing that the larvæ of *Thecla W-album* are cannibals, as I have stated before that Society several times that such was the case. I have bred it for several years, but never put them together until they attain the pupæ state, otherwise I found some of them thriving remarkably well on others which were getting beautifully less.—C. J. BODEN; 153, Snowsfields, Southwark, July 4, 1881.

LARVÆ OF GENUS THECLA.—As regards the larvæ of the genus *Thecla* being cannibals, I beg to say that I have noticed it this year for the first time in *T. Quercus.* I found eight larvæ on May 31st (in Hampshire) nearly full grown. A few days after, I saw one larva which was preparing to "pupate" being eaten by three others. They were well supplied with fresh oak-leaves twice a day. I did not separate them afterwards. but there was no more cannibalism.—M. S. JENKYNS; Riverside, East Molesey, July 12, 1881.

APATURA IRIS *var.* IOLE.—I have taken this season numerous specimens of *Apatura Iris* in our county. Amongst them is a large and beautiful example of the black variety *Iole*. This is the second that has fallen to my net, having captured another on the same ground four years since; but that specimen was much worn, whereas the present insect is but little removed from a bred one in condition.—E. Sabine; 17, The Villas, Erith, Kent.

Apatura Iris.—The larva of this beautiful insect was recorded for the first time by Mr. Drury, who took it on the 26th May, 1758, whilst beating the sallows near Brentwood, Essex.—J. Humble Ralph, July, 1881.

Stridulation in Arctia caja.—While examining a specimen of *Arctia caja* this morning I permitted it to walk up my hand. During the act of crawling it suddenly and several times uttered a sound as loud as, and similar to that produced by, the death's-head (*Acherontia Atropos*). So remarkable was the noise that my brother, who was in the room at the time, left his work and came over to see what caused it. I have never seen any notice of stridulation in this species, and should be glad to know if any of your correspondents have made a similar observation.—Edward Lovett; Holly Mount, Croydon, S.E., July 22, 1881.

Abundance of Orgyia Antiqua in London.—Without fear of contradiction the Vapourer Moth may be said to be the commonest in town, go where you will up street, down street, or "all round the square." For some weeks to come you will be sure to see the little brown gentleman dancing about, ziczacing in the sunshine both morning and afternoon. Although the insect is so common, I would call attention to the extraordinary number of larvæ which have appeared this season in London. Persons walking up "The Mall," for instance, can hardly fail to have observed the condition of the lime-trees in that avenue, more especially from Buckingham Palace to Marlborough House. Some few are quite denuded of leaves, only the skeletons and midribs being left; many have large boughs served in the same way, and looking up at these boughs defoliated by the innumerable jaws that have been at work upon them we can soon see the cocoons of this moth, not one here and there, but in regular clusters, so abundant are they. The thorns in the parks, too, have been almost as badly served. In passing along the Mall this morning I observed numbers of cocoons spun up on the bark of the plane-trees, and here and there a female had covered them with her eggs; while many were crawling about the stems of the trees.—V. R. Perkins; 54, Gloucester Street, Pimlico, S.W., July 20, 1881.

Boletobia fuliginaria in London.—I am pleased to inform you that I have been fortunate in having another specimen of *Boletobia fuliginaria*, handed to me by the same man who took the one I recorded in 1879. This was taken on our warehouse door, in Upper Thames Street, when opened this morning. It is a male, and in good condition.—J. R. Wellman; Elm Park, Brixton Rise, S.W., July 14, 1881.

Abundance of Hybernia defoliaria and other Larvæ in the New Forest.—Having visited the New Forest about the middle of June I was very much surprised to find the oak trees, in this proverbially leafy month, as bare and leafless as in "dark December." The contrast between the bright beautiful green of the ferns and the grey dead appearance of the oaks was very striking; it was the difference between life and death: in fact I heard an old man say, "All the oaks in the forest are dead." Such a phenomenon is, I believe, happily rare in this country; at all events the oldest inhabitant of the locality I visited (Holmsley) does not remember any similar occurrence. Having examined the trees I found that myriads of *H. defoliaria* and other larvæ, having denuded them of every particle of foliage, were hanging from the leafless branches by silken threads, or ravenously consuming the brambles and other green herbage on the ground. The incessant rasping noise of countless thousands of jaws was distinctly and strangely audible. I do not know whether this phenomenon was local, or extended over the whole of the forest. Perhaps some other correspondent may favour us with his experience. Insects generally are abundant this season n the forest; but *Triphæna pronuba*, in numbers as well as variety, surpasses all other species. I would strongly recommend collectors to take a good series of this common, but beautiful, moth, as several varieties can now be obtained which are rarely een in ordinary seasons.—W. M'Rae; Westbourne House, Bournemouth, July 20, 1881.

On the Rearing of Leucania obsoleta from the Larva.—At the latter end of August, 1880, whilst on an entomological isit to Buckinghamshire, at the end of a day's run I took home number of the stems of *Arundo phragmites*. They were placed upon a table in my room that night, and I was agreeably surprised at finding that my reeds were tenanted by some beautiful larvæ, of which the following description was taken some weeks later on:—Larvæ two inches in length, stout in proportion; the head is globular and projected in crawling; the body is cylindrical, the skin smooth and glossy; after retiring to its winter rest becomes wrinkled and puckered; the body is yellowish gray, beautifully tinged with a rosy hue which is very perceptible in the interstices of the segments where the skin is folded; the dorsal line white, bordered with dark green; subdorsal line slender and whitish; a pale line along the spiracles, which are black, with a grey centre. The head brown, with darker markings down the face. These larvæ fed only by night on the leaves of the reed, retiring during the day in the hollow stem of the same. This was during the months of August and September. At the beginning of October the larvæ finally settled down *within the reeds*, spinning some silken threads to keep themselves secure. Soon after retirement the colour of the skin began to fade, till it finally became of a pale dingy yellow; it remained in this condition till the following May. The larva, if disturbed during this period, is very lively, crawling quickly out of sight if shaken from its resting-place. I observed little diminution in the size of the larva during its long abstinence. In the middle of May they changed to pupæ of a chestnut-brown colour, and the moth appeared about four weeks later on. The last came out on the 11th of July (present month).—J. HUMBLE ROLFE; July, 1881.

EXTRAORDINARY ABUNDANCE OF TRIPHÆNA PRONUBA.—During a short visit in the Isle of Wight, at the end of last month I observed *Triphæna pronuba* everywhere I went in the most extraordinary abundance. In Daishe's Hotel, Shanklin, they were swept from the hall and passages each morning by scores where they had been attracted by light. As the train passe through the country they rose in numbers from the herbage by the railway side. While walking from Ventnor to Sandrock Hotel, by the cliffs, they were flying in abundance during the ho sunshine.—JOHN T. CARRINGTON; Royal Aquarium, July, 1881.

LEPIDOPTERA AT LYNDHURST.—At the end of last month went to Lyndhurst for a week's collecting. At sugar there wa not a great variety of insects, but those that did occur wer plentiful. *Leucania turca* was in great numbers, there were constantly three or four on a tree. *Diphthera orion* was also very abundant on some nights; at times I could have taken twenty or thirty in an evening. *Aplecta herbida* were also plentiful, mostly in good condition. *Boarmia roboraria* and *B. consortaria* generally put in an appearance about 10.30 p.m.; they were both to be taken plentifully in the daytime on trunks of trees. I also obtained at sugar one *B. repandata* var. *conversaria*. *Thyatira batis, Noctua brunnea, Xylophasia hepatica*, and other common insects, were abundant. In the daytime I took several males of *Euthemonia russula*, also a couple of females; a few *Macroglossa fuciformis* at the rhododendrons; *Lithosia rubricollis* were extremely plentiful. I also took *Arctia fuliginosa, Acidalia strigillaria, Anarta myrtilli, Phorodesma bajularia* (at dusk), *Calligenia miniata*, &c. Among the butterflies *Argynnis Paphia, A. Adippe* and *Limenitis Sibylla* were all extremely plentiful and in perfect condition. On the 2nd inst. I had the good fortune to capture an extraordinary variety of *L. Sibylla*, nearly approaching the black variety; I took one *Leucophasia sinapis*, and saw two *Pieris cratægi* taken, but both were much worn.—N. C. GRAHAM; Silwood, Tulse Hill, S.W., July 19, 1881.

LEPIDOPTERA ON THORNE MOOR.—On a recent visit to Thorne Moor, in Yorkshire, I captured, amongst a number of other species, *Acidalia circellata, Hyria auroraria, Crambus Warringtonellus, C. margaritellus*, and *Phycis carbonariella*. *Chortobius Davus* was abundant, but I was informed by a friend who lives in the locality that *C. Pamphilus* has never been taken on the heath proper, although it has occurred in the lanes and fields in the neighbourhood.—W. PREST; 13, Holgate Road, Yorks.

LEPIDOPTERA IN JUNE.—*Stauropus fagi* has been taken not uncommonly in Epping Forest this season; specimens have also occurred at West Wickham, where *Notodonta carmelita* was again found. The larvæ of *Thecla betulæ* were very common at Epping, as were also those of *Anthocharis cardamines*. At Chingford *Angerona prunaria* was abundant. *Lithosia aureola* not uncommon, neither was *Eurymene dolabraria*. The oaks in Epping Forest and neighbourhood have been rendered quite leafless by the larvæ of *Tortrix viridana*.—THOMAS EEDLE; 40, Goldsmith Row, Hackney Road, London, E.

LEPIDOPTERA IN NORTH DEVON.—I am very busy at sugar just now. The common moths about here have not often been invited to such repasts as I have given them. They are the most greedy set of gourmands I ever met with. *Aplecta herbida* is to be had freely, as is also *Apamea gemina*, with *Thyatira batis* and *T. derasa*. The banded form of *Boarmia repandata* turns up now and then. I take with the net *Botys terrealis*, *Pterophorus tephradactylus*, and *P. Zetterstedtii*. Also two or three *Eupœcilia curvistrigana*. —R. SOUTH; July 2, 1881.

LEPIDOPTERA AT PLYMOUTH.—We have not yet recovered the wet seasons of the past two years with regard to Lepidoptera; one can walk miles in the woods around Plymouth and not see a single leaf eaten. I went out on Thursday and did two hours' beating for larvæ, and obtained two *Amphydasis betularia*. The imagos of Lepidoptera are just as scarce.—G. C. BIGNELL; 7, Clarence Place, Stonehouse, Plymouth, July 25, 1881.

LEPIDOPTERA IN LONDON.—On several warm evenings in June I have seen moths flying round the electric lights in the city. One of them I caught at rest on the wall of St. Mary Woolnoth Church, at the corner of Lombard Street; it was *Arctia menthastri*: this one probably came from the enclosure in the Bank of England. I have occasionally, too, seen the males of *Orgyia antiqua* flying in broad daylight in the Strand.—C. E. M. INCE; 29, Stephen's Avenue, Shepherd's Bush, W., July 4, 1881.

INSECTS ATTRACTED BY ELECTRIC LIGHT.—I have another note to add about moths and the electric light. Yesterday, while walking over London Bridge, I saw some workmen who had just been cleaning out or repairing one of the electric lamps. One of the men had a large moth in his hand, which was a small and slightly damaged specimen of *Cossus ligniperda*. The workman said that he "found a plenty of them sort up there"; meaning round the lamps.—C. E. M. INCE; July 6, 1881.

NOTES ON THE SEASON. — Although we certainly cannot complain this summer of any deficiency of sunshine, and the heat has at times been almost tropical, insect-life has been by no means so prolific, at least in this district, as we might have expected. In the spring the garden whites, *Pieris brassicæ* and *P. rapæ*, were more than usually numerous in the perfect state. I did not notice a corresponding amount of larvæ, and the cabbages have been peculiarly free from their attacks. *Limenitis Sibylla* in one small wood appeared in some numbers in the last week of June, when they were just fresh from the chrysalis. I bred several specimens of this species from larvæ collected in the New Forest, and cannot help remarking upon the difference in the intensity of colour between these and the Chichester insects. Contrary to what one would have thought, the bred Forest examples are not nearly so black, though larger. Several larvæ of *Apatura Iris* were found by Mr. C. Gulliver on sallow (*Salix caprea*) in the New Forest in the spring. I myself bred eight imagines, but only four really fine. These were males; the one female that emerged was unfortunately slightly deformed, the right upper and under wings being a trifle smaller than the left pair. It may have been noticed often before, but I was struck with a peculiar habit of this butterfly upon its emergence from the pupa. In every case that I observed it was the practice of the insects to remain for several hours clinging to the pupa-case, with the head upwards and the wings hanging downwards. They then reversed the position, and, still clasping the pupa-case, continued motionless, with the head down and body up, for another three or four hours; after which, if allowed to live, they dashed wildly about the breeding-cage till they settled down comfortably to sleep about six o'clock in the evening. When thus locked in the arms of Somnus, I judged the most fitting opportunity for killing them, a small drop or two of chloroform quickly putting them into a state of insensibility. I fed one with honey from a *Gloxinia*, which it sucked up with evident satisfaction, and another seemed to enjoy the perspiration from my hand. Hitherto there have been only few of the common *Vanessas*, such as *V. Io*, *V. Atalanta*, and *V. cardui*; but hybernated *V. urticæ* have been exceptionally abundant. The moth of the season is certainly *Tryphæna pronuba*, which has appeared in profusion. Every flower in the garden teems with them, and they are a perfect pest at sugar. *Plusia gamma*, strange to say, is just as scarce. Sugar has attracted little besides common species as yet, as *Mania maura*, *Orthosia ypsilon*, &c. Of Geometers I have found very few, but the rare little *Eupithecia irriguata* turned up in some numbers in the New Forest. The larvæ of *Arctia caja* were numerous in May. I collected a quantity of them in hope of a variety. None emerged sufficiently distinct to be of any value, though there was much dissimilarity in the ground colour of the hind wings, the red in some cases being faint, with a tendency to yellow, especially round the steel-blue spots.—Joseph Anderson, jun.; Chichester.

Notes on the Season.—I cannot give any satisfactory information as to the abundance of Lepidoptera this season, not being able to go out collecting. In my garden I have seen a good many Noctuæ in the evening lately, *Tryphæna pronuba* being particularly abundant. I hear from various correspondents that common Noctuæ are plentiful. The Tortrices that infest roses are far too plentiful this season.—Frederick Bond; Staines, July 20, 1881.

Collecting in the Hebrides.—My collector has so far found this season most unsatisfactory in the Hebrides, chiefly owing to the excessive rain, which has now lasted for many weeks and left the bogs in a most uncomfortable state for work. His best capture has been some exceedingly fine stone-coloured varieties of *Boarmia repandata*: some of these are very light in colour and beautiful in appearance. They differ in a very marked manner from any other variety I have seen of this species. Interesting forms of *Cidaria russata* have appeared, from which I have a number of ova. It will be interesting to see if these types are perpetuated when the insect passes through all its stages in our very different and much dryer climate. *Camptogramma bilineata* is variable from the western isles; dark forms predominating, some being nearly black. *Chortobius Davus* is small, much smaller than Rannoch specimens. *Melanippe hastata* is very rich in colour, the dark markings being exceptionally black and showing well in contrast with the pure white ground of the wings.—E. G. Meek; 56, Brompton Road, S.W., July 22, 1881.

Esher Woods.—To those entomologists residing in Londo who have but little time for pursuing the science, the opening u of new localities in the neighbourhood of the metropolis is a grea desideratum. Claygate covers and the Esher pine-woods ar within an hour's walk from Surbiton Station, half an hour's run from Waterloo; yet they are not worked as they deserve to be On July 2nd I saw *Argynnis Paphia* out already, and *A. Adipp* will probably soon follow. Sugaring the same evening, I took dozen of *Leucania turca*, some *Aplecta herbida*, *Acronycta ligustr* many *Xylophasia hepatica*, *Thyatira batis*, *T. derasa*, and one or two *Heliothis marginata*, &c. *Phorodesma bajularia* was flying in numbers, a dozen falling easily to my net; and *Tephrosia consortaria* was resting on a sugared tree, whether attracted by the sweets or not I do not know. *Erastria fuscula*, which is very abundant in the pine-woods, was nearly over, but I took three or four. A worn male *Euthemonia russula* turned up, and *Anarta myrtilli* was very abundant on the heath. — H. K. HARRIS; 2, Richmond Villas, London Road, Kingston-on-Thames.

SUGARING AT DARENTH.—Whilst sugaring in Darenth Wood on Saturday (10th July) I had the good fortune to capture, amongst many commoner insects, two *Acronycta leporina*, *Hadena contigua*, *Aplecta tincta*, and a very fine specimen of *Orthosia suspecta*. Is not the occurrence of the last-named species in the South of England rather unusual?—J. A. FINZI; 105, Gower Street, W.C., July 11, 1881.

AN AFTERNOON IN WICKEN FEN.—I am glad to be able to put on record one of the most successful afternoons as regards collecting I ever made. On June 26th I strolled into the fen about three o'clock, and shortly saw such a sight as would have made glad the heart of the most morose entomologist. In less than two hours I boxed nearly two hundred specimens of really good insects. *Phoxopteryx palludana* was common, as was also *Eupœcilia notulana*, the latter very fine both in condition and size. The extremely rare and beautiful *Cosmopteryx orichalcella* was flitting over the fescue grass (*Festuca*): of this I got a nice series. *C. Lienigiella* was also taken. *Bucculatrix frangulella* was abundant round bushes of buckthorn (*Rhamnus catharticus*). I got a single specimen of what must be *Eupœcilia Geyeriana*, but from the fact of its being a month earlier than the Norfolk specimens, and being so much smaller and brighter in colour, made me at first think I had got an addition to our list. Since then I have, however, obtained a longer series, and find they vary to a considerable extent, some specimens being almost counterparts of *E. vectisana*. *Penthina carbonana* was not uncommon. *Anesychia funerella* was abundant amongst the comfrey (*Symphytum officinale*). *Chauliodus illigerella* was flying at dusk with *Coleophora anatipennella*, as also was *C. troglodytella*. *Gelechia inornatella* was scarce, with *G. rufescentella*, and five specimens of

G. lathyri fell to my net. *Lobophora sexalata* was frequent. *Herminia cribralis* and *Paraponyx strateolatis* were in great abundance. When I had a short interval of rest from using the net I found larvæ of *Gelechia morosa*, from which I have since reared several specimens. Larvæ of *Peronia hastiana* were common, and from amongst them *Phoxopteryx subarcuana* have appeared. I think, from the very incomplete sketch I have given your readers, they will agree with me "that such an afternoon" rarely falls to the lot of the entomologist.—E. G. Meek; 56, Brompton Road, S.W., July 22, 1881.

Gelechia cerealella.—Two years ago a friend gave me two cobs of a small sort of Indian corn or Maize, telling me that larvæ of some kind were in them. Last year some moths came out while I was from home, and were quite spoiled before I returned. About a month ago I saw in my room two or three small moths, and on looking at them I saw they were not, as I first supposed, *Tinea bisselliella;* I then recollected my cobs, and on looking at them saw some moths in the box and found they were *G. cerealella*, a spêcies I had not seen or heard of for more than twenty-five years. I have set a good many specimens. —Frederick Bond; Staines, July, 1881.

Gracilia pygmæa.—This little longicorn is said to occur "not unfrequently in old wood-work, twigs, &c." It has never been my lot to meet with it in any number before this present time. I have only come across single individuals, and those I may say by mere chance. Last year I only met with one, and that in my own house; and this year it turned up again. While I was sitting talking to a friend who called on Monday afternoon, I saw one running about, but failed to secure it, as it fell from my wetted finger before I could put it into my bottle; and, though we both searched well after it, we could not find it again. The next morning, while reading a newspaper after breakfast, I found another crawling up my sleeve; this one I lost exactly in the same manner; it fell apparently to the carpet, but even three pairs of eyes could not detect its whereabouts. Thinking there must be more about, I searched everywhere I could think of, but without success. However, on Wednesday I came upon its habitat; a few days before, I received from Wotton-under-Edge a small hamper of fruit for preserving, and, as the hamper was to be returned, it was put into my store-room to be ready for sending back, and as I was going to put some things into it I of course had to move it, and struck it on to the floor with a smart jar; when lo! and behold! the ground seemed all alive in a minute with these little beetles; but to secure them was no easy matter, they were so uncommonly active. I managed, however, to get some two or three dozen into a wide-mouthed bottle that was at hand, while many escaped, probably to turn up again. Though they were not left very long in the bottle, they seem to have made use of their time in disfiguring one another, as many had their antennæ shortened and their tarsi mutilated. How many had been shaken out of the hamper on its Midland journey *viâ* Birmingham and Bedford it is impossible to say, but evidently there were plenty left in it.—V. R. PERKINS; 54, Gloucester Street, Pimlico, S.W., July 23, 1881.

PHÆDON BETULÆ (Sharp, Cat.).—Can you, or any reader of the 'Entomologist,' tell me what is the food-plant of *Phædon betulæ?* In the few instances that I have met with it "at home" it has invariably been on the water starwort, *Callitriche verna.*—THOMAS H. HART; Kingsnorth, Ashford, Kent, June 22, 1881.

[There is great confusion existing in the nomenclature of our four species of *Phædon*, especially in those species badly named in relation to some special food-plant. *Phædon betulæ* is, I believe, generally abundant in watery places, feeding specially on the various *Cruciferæ* living in such situations, its larva also riddling their leaves; it is particularly partial to watercress. Of late years I have received many specimens as being a serious pest to our mustard crops, especially in the eastern counties, but have it also from Ireland (see Curtis' Farm. Ins., p. 103; Inj. Ins. Report, 1877, p. 19, 1879, p. 35; and Entom. xiv. 44). Kaltenbach summarises the continental knowledge thus:—"*P. betulæ*, L. (= *P. cochleariæ*, Fb.), may be found, according to Gyllenhall and my own observation, on *Veronica beccabunga;* more commonly I have beaten this species in the spring from *Cardamine amara*, growing in wet places in woods. I have frequently found its larva with those of *Helodes beccabunga*, Hellw., feeding on the underside of the leaves of the 'Quellen-Ehrenpreis' (*V. beccabunga*). It undergoes its metamorphosis in the earth; the pupa state only lasting fourteen days. Herr Cornelius observed two generations; the spring brood of the larvæ he found in May and June, and the second generation in September (Stett. Ent. Zeit., 1863, p. 123). In 1861 this beetle committed great ravages on the blooms of the 'Meerrettigs' (*Cochlearia Armoracia*) at Molin, in Bohemia, so that there was quite a failure in the production of the far-famed 'Moliner Krenes,' the cultivation of which supports many hundreds of families." Differing from this synonymy Dr. Sharp makes *P. betulæ*, L., = *armoraceæ*, L., of Wat. Cat., and *P. cochleariæ*, Fb., = *betulæ* of Wat. Cat., but not Linné. Dr. Power writes: "*P. betulæ* of Sharp is larger than *P. betulæ* of Waterhouse, and may at once be known by the callosities on its shoulders. It is less common than the smaller species. They are, however, both very abundant in wet places, affecting, I believe, *any* of the *Cruciferæ;* I do not believe they are very particular which; certainly they abound on the watercress, but I suspect that the little one is more omnivorous and less aquatic than the other species with callosities. I have recently seen it utterly destroying a crop of horseradish, &c., in a garden at Cowley."—E. A. F.]

CLADIUS VIMINALIS LARVÆ DESTRUCTIVE TO NUT-STUBS.—In the early part of this month a friend at Burnham, in this county, complained that the leaves of his nut-stubs were completely skeletonised by some greenish S-shaped caterpillars with black spots, which were in the greatest abundance, thus giving the stubs a very bare appearance; and that the promise of an abundant crop was quite spoiled, as the young nuts had nearly all fallen off the trees. By request some hundreds of these larvæ were sent me, and I was surprised to find them the larvæ of the common poplar and willow-feeding *Cladius viminalis*, Fallen. I find no notice of hazel as a food-plant of this sawfly larva, and, curiously, both poplar and willow are quite uncommon in the locality where this species has this year become destructively abundant. Last week I saw the devastated trees, and the leaves are quite gone; but some considerable quantity of young nuts and leaf-veins could still have been gathered up from under the trees.—EDWARD A. FITCH; Maldon, Essex, July, 1881.

ODYNERUS PICTUS; CONTRIBUTION TOWARDS ITS LIFE-HISTORY.—On the 20th June I was in the Plymouth cemetery, and on passing a monument erected to the memory of the officers and men belonging to H.M. steam sloop 'Vixen,' about six feet from the ground I saw what appeared to me to be a handful of mud thrown at it, and lodging on the upper portion of a raised anchor which surmounts the inscription. Upon removing a small portion it disclosed a tomb containing eleven full-grown living larvæ of a *Sciaphila* (very probably *S. perterana*); the wretch who has entombed these, thought I, evidently did not believe in cremation. They had been stung without doubt, which had produced paralysis; at the bottom of the tomb was the small yellow larva of *Odynerus pictus.* I opened two, each contained the same. I brought home the larvæ, and forwarded two to Mr. Barrett for identification. I again visited the spot on the 24th, when I captured the lady, who had in the meantime re-plastered the cells I had broken, and had completely provisioned and sealed up two others; these two I opened on July 13th, and found the larvæ of *O. pictus* full fed, and the larva in the cell completed on the 24th about to commence its silken cocoon; I removed it into a glass tube, in which it completed its winter domicile in about four days. From these observations it will be perceived that the larva of the future wasp is full-fed in eighteen days from the completion of the cell; these cells were placed on the south side and exposed to the full rays of the mid-day sun. The larvæ of the *Sciaphila* that I removed on my first visit were only able to turn round from first to last, having lost all power of locomotion or contraction of the body: they remained in this state about sixteen days, when they began to dry up, although they were kept in a glass tube.—G. C. Bignell; Stonehouse, July 18, 1881.

Queen Hornet at work.—On June 24th, whilst working in my potting shed, I became aware of a powerful buzz overhead, and looking up I saw a monster hornet making its way to an egg-shaped globe, about the size of a lemon, suspended from the roof. It was a thin shell of mortar, with a hole at the bottom sufficiently large to enable me to see the hornet at work inside; and I think it will be as surprising to others as it was to me to know that, although when I first observed her the shell was perfectly empty, by the morning of the 28th—less than five days—she had constructed twenty-six cells: two were empty, seventeen contained eggs, five had good-sized larvæ, and the remaining two were already sealed up for the pupa stage. At this juncture I deemed it prudent to secure the entire "ménage," mother and all, which

I accomplished, with only slight damage to the nest, by means of a large cyanide bottle.—R. S. STANDEN; Alby Hill House, Norfolk.

THE LATE MR. BLACKWALL.—A few years ago I received a letter from this veteran of science, in which he told me of the place and date of his birth. As these differ from those supplied in your interesting obituary notice, it may be well to put them on record. He said that his birth took place at his father's house in St. Ann's Square, Manchester, on January 20th, 1790. His father, Thomas Blackwall, was a draper, and afterwards an importer of Irish linen. He lived, as was the custom of the period, at his place of business; and it was not, I believe, until later that he went to reside at Crumpsall Old Hall. John Blackwall was for some years in partnership with his father; but in 1833 he retired from commercial pursuits, and fixed his abode in the vale of Conway. It may be useful to some of your readers to point out that the 'Catalogue of Scientific Papers,' published by the Royal Society, contains a list of sixty-four papers, written by the deceased gentleman.—CHARLES W. SUTTON; Manchester Public Free Libraries, Manchester, July, 1881.

[In the obituary notice of the late John Blackwall, F.L.S., at p. 147, line 20 from top, *for* "1847" *read* "1874."—O. P. C.]

ERRATUM.—Entom. p. 163, line 15, *for* "sunflies" *read* "sawflies."

REVIEWS.

Second Report of the United States Entomological Commission on the Rocky Mountain Locust. Washington: Government Printing Office. 1880.

THIS second report contains the result of the labours of Messrs. Riley, Packard, and Thomas, with their assistants, during the years 1878 and 1879. The first report (1877) treated largely of the natural history of *Caloptenus spretus* and its allies, and was practically exhaustive on the destruction of the young insects in their trans-Mississippi breeding-grounds. This second report directs attention to the prevention of injury from the disastrous winged swarms arriving in the cultivated states from the north-west. Mr. Thomas enters most fully into the facts concerning the laws governing the migration of locusts in all countries, and arrives at some very interesting conclusions, after thoroughly examining, and giving a brief summary of, the extant literature of the subject, from Pausanias, Livy, Pliny, &c., to the present time. In some few instances he tells us a species may be migratory in one district, and in another may be truly sedentary, *e.g.*, *Acridium Americanum* and possibly *Pachytylus cinerascens.* Mr. Thomas also assures us that there are but two European species of true migratory locusts (*Pachytylus migratorius* and *Caloptenus italicus*).

The following important result is eventually arrived at:—"Our conclusion, therefore, is that the migratory habit or instinct of locusts, whether in the Eastern or Western Continent, is directly attributable to the arid condition of the area in which they originate; that the unusually dry and rarefied state of the atmosphere is the chief factor in originating this instinct; that while it affects, to a greater or less extent, all parts of the insect, its chief influence is produced by its effect on the tracheæ and air-sacs. It also must have a tendency to harden the integuments, and to shrink or lessen the size of the softer parts. As a very general rule, more species of the Œdipoid groups are found in barren areas than of the Acrididæ; the Acrididæ, on the other hand, are generally fleshier, or, to use a botanical term, more succulent than the Œdipodæ; it follows, therefore, that the effect of unusual dryness would manifest itself much sooner in the Acridians than in the Œdipodeans, and such is undoubtedly the fact." Then follows an examination of the varying effect of the dry years 1874—6 on the "trim" *Caloptenus bivitattus*, the "more lubberly" *C. differentialis*, and the "wild, ferocious-looking" *C. spretus.* The fallacy of the periodicity theory of migratory flights is well shown, although in both Continents there appears to be a tendency to their occurrence about every eleven years.

The report is full of valuable meteorological and agricultural data bearing on the various phases of the locust question. It contains some very exhaustive chapters on the anatomy and histology of the Orthoptera, by Mr. Packard and Mr. Minot, admirably illustrated with fifteen plates and several woodcuts. Mr. Riley contributes further facts on the natural enemies of the locusts; the interesting, and previously but slightly known, economy of the *Bombyliidæ* being illustrated with a coloured plate. Mr. Scudder contributes a list of the Orthoptera collected by Dr. Packard in the Western States, twenty of the new species described being figured. This volume also contains a large coloured map in six sheets and three plain maps, illustrating the breeding-grounds, and showing the course of the migrations of the grasshoppers and the natural characteristics of the regions.

Altogether, these two reports on the destructive American grasshoppers are one of the best exponents of how much is to be learned about a single insect or group of insects. They can but be very beneficially studied by all entomologists; their practical value must be immense; the labours of the commission were arduous, but the results arrived at are quite beyond expectation. The United States Government generally and the members of the commission specially, deserve to be congratulated on their success.—E. A. F.

Transactions of the Epping Forest and County of Essex Naturalists' Field Club. Vol. II., Part IV. June, 1881.

The Committee and Secretary of this energetic young Society are to be congratulated upon this series of Transactions. The number before us contains several articles which will be found interesting to our readers. The first we reprint in this number of the 'Entomologist.' Another is that by Mr. Raphael Meldola upon "The Developmental Characters of the Larvæ of the Noctuæ as determining the position of that Group." This paper is well worth our reader's perusal, whether he may fully agree with the whole of the theories advanced or not. Mr. English gives an interesting account of "The First Night's 'Sugaring' in England," which he further terms a "Reminiscence of Epping Forest in 1843." In this paper Mr. English claims to be the discoverer of that mode of attracting moths now so universally adopted by lepidopterists. The geological and anthropological sections are illustrated by engraved plates.—J. T. C.

The Butterflies of Europe. Illustrated and described by Henry Charles Lang, M.D., F.L.S. Part I. Four coloured Plates, 16 pp. super-royal 8vo. London: L. Reeve & Co., 5, Henrietta Street. 1881.

We have already noticed that this valuable work was in the press, and it is now our pleasure to see the first part, which fully confirms our expectations. The introduction is explicit, the letterpress clear, and the plates are excellent. The circulation is sure to be large.—J. T. C.

THE ENTOMOLOGIST.

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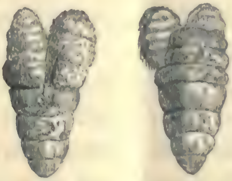
NOTES ON AN ABNORMAL PUPA OF *BOMBYX MORI*.

By E. Kay-Robinson.



Abnormal pupa of Bombyx mori.

The above figure represents an extraordinary monstrosity of *Bombyx mori*, the silkworm of commerce, which partially emerged from the pupa state on July 14th. It consists of two specimens, perfectly separate as far as can be seen, one male and one female, contained in a single pupa. This in itself seems hardly credible, but the marvel is heightened by the fact that they are the production of a caterpillar of the usual size and appearance, that they are situated upside down, that is to say both their heads, if they have one each, are still firmly fixed where the abdomen of the imago ordinarily is. The pupa-case presented the usual outlines of wings and limbs, and yet these outlines did not correspond to the actual limbs of either of the inmates, but were simply traced as useless decorations upon that part of the pupa which contained the two abdomens.

The larva, among a small family of six, seemed in no way remarkable, and the pupa was certainly of the ordinary size and shape. In fact there was nothing noticeable about any of my six silkworms in their immature stages, except that they appeared to get very ill when I fed them on lettuce, and were one and all rather stingy in the matter of silk. Five emerged in the way in which a proper-minded silkworm should, but the sixth, to my astonishment, seemed to have so far forgotten itself as to endeavour to come out tail first from the pupa. My surprise was increased by observing later on that there was evidently another imago of a different sex in the same pupa, equally anxious and equally unable to distinguish itself by emerging upside down. From July 14th to 20th they solemnly waved their abdomens in the air without cessation, and then the female tail settled down to the business of life, and laid five eggs, apparently expiring on the 22nd of July. Roused, however, by a stern sense of duty, she revived on July 24th, and laid another egg; then I think she really died. The male is still—July 26th—alive, though not active; he seems resigned to his fate of partial imprisonment for the rest of his mortal life.

On the old theory that the different integuments of the larva and pupa were simply so many coverings of the imago, which were peeled off in turn like the skins of an onion, such an abortion would be absolutely impossible; and even our modern knowledge that certain transformations occur in the internal organs of the insect to accompany each change of outward appearance, does not help us much to conceive the possibility of such an aberration. Between the last stage of the larva and the production of the imagines in the specimen in question, one of two startling operations must have been formed: either each organ must have divided into two, and a double set of sexual organs have developed themselves, and then the whole contents of the pupa must have violently turned round in the shell, so that the two heads and the two tails changed place; or else the head of the larva must have been developed into two sets of anal appendages, male and female, the true legs of the larva having been withdrawn. The abdominal segments of the larva have become the thoracic divisions of two imagines with legs, wings, &c., developed in addition, and the anal segments grown into two heads with all their marvellous arrangements of palpi, antennæ, &c.; and further, the liquid which the imagines excreted on emerging must have been lodged in what was the head of the caterpillar. The turning round of the imagines in the pupa-case seems impossible for lack of space, and therefore the second hypothesis must be adopted. The changes implied in it are so enormous as to stagger belief, were it not that the specimens are still, and will probably remain, *in statu quo* to prove the matter. It really seems almost parallel with the case of a man retiring to his room for the purpose of undressing, and then discovering that his clothes contained two persons,—a man with his head in one boot, and a woman with her head in the other, and all their feet in his hat!

Datchet, Bucks, July 26, 1881.

[As Mr. Kay-Robinson suggests, "The changes implied are so enormous as to stagger belief." I have examined the subject carefully, and find the insects just as described and figured; but as to how they came to be in such an extraordinary position is past my comprehension.—J. T. C.]

A LIFE-HISTORY OF *APATURA IRIS.*

By Albert Brydges Farn.

On 19th July, 1880, I caught in one of the Sussex woods a female of *Apatura Iris*, and on the following day obtained two others. I placed these three females in a box with a spray of the broad-leaved sallow and some crushed fruit. They remained in this box until my return home, and were during this time quiescent and had laid no eggs. On July 22nd I covered a sallow bush with a huge bag of leno, and into it put the three females. While they were in the leno bag on the sallow bush, I fed them by crushing raspberries against the gauze, the juice of which they sucked up with avidity. I first observed that they had deposited eggs on July 25th, and do not think these eggs could have hitherto escaped my notice, as I looked most carefully two or three times daily. The eggs were laid on the upper side of the leaves, and I noticed as many as six eggs on one leaf and five eggs on another. Under perfectly natural conditions I believe—having frequently watched the females of *A. Iris* ovipositing—that no more than one egg is laid on a leaf. The eggs are semi-spherical and when first laid of a green colour, similar to those of *Smerinthus populi.* I watched these eggs from day to day until I left home for ten days, and no alteration of colour had up to that time taken place. Upon my return home I at once went to see if these eggs had hatched, but I could find none from which a larva had emerged; they had, however, become almost black, and in some I could see that there was evidently a larva in the interior.

On August 11th the larvæ commenced to emerge, and soon after this had occurred some of them commenced to eat up the egg-shell. When first emerged the larva is about two inches in length, of a sap-green colour, with large dark brown head; the head seems to be almost as large as the egg from which the larva has emerged, and is considerably larger than the second segment; the body tapers to the anal extremity. Each larva at once takes possession of the upper extremity of a leaf, where it spins a small web on which it stands; it nibbles the edge of the leaf on either side of this web in an irregular fashion, but always returns to the web it first spun. It grows very slowly, but its body becomes of a more decided green, similar in shape to that of the larva of *Thecla betulæ*, and is finely irrorated with yellow; these yellow spots gradually become confluent on the sixth segment, where they form a yellow crescent.

On August 18th I noticed that some seemed as if they were undergoing a change of skin, as they remained with the head and anterior segments raised from the leaf and had ceased feeding; immediately behind the head a yellowish appearance of the skin began, which increased day by day, and on the morning of the 21st two had completed a moult. Never was a transformation more extraordinary; in place of a dark round head, with scarcely any depression between the lobes, there appeared a pale greenish red head with lobes prolonged into two long horns which stretched out in front, in length equal at least to a third of the whole larva, and studded by short spines; the colours were brighter, and the fine spots of yellow were more distinct. The larvæ principally feed at night, and remain at rest on their webs at the extremities of the leaves during the day. On September 7th the larvæ commenced a *second* time to change their skin, which process takes about three days.

During the week ending Saturday, October 9th, rain fell in torrents, and during the whole of this time the larvæ remained at the extremity of the leaves, and were more than half submerged in the water hanging from the leaves. One by one the larvæ disappeared towards the end of October; but I failed to trace them to their winter quarters, and concluded that they had sought refuge amongst the leaves which had accumulated at the bottom of the gauze bag. At intervals during the winter I searched for them, not, however, removing the bag; but it was not until March 12th of this year that I discovered their whereabouts. I found that each larva had spun a little silken mat at the bifurcation of a branch from the main stem, and had changed to a dirty brownish green colour, almost exactly the colour of the stem of the sallow; they were now about half an inch in length, and the horns on their heads were carried straight out in front; they remained in this position until the first week of April, at which time the sallow-leaves had become fairly developed and most of the catkins had fallen. On April 12th they had all left their *hybernacula.*

On May 5th many of them commenced casting their skins for the third time, and completed this operation on the 8th of that month; after this change they resumed the brownish green colour which they had lost while hybernating. On May 22nd some began to change their skins for the fourth time, and effected this by the 26th. On June 15th one commenced to pupate, and had effected this in three days and a half; on the 19th I brought indoors fourteen pupæ.

The pupa is attached by the last segment to the under side of a leaf, which leaf has been firmly attached to the stem by means of silk spun by the larva completely round the footstalk, after the fashion pursued by various silk-producing Bombyces. In addition to this, the edge of the leaf is also attached by silken bands to the stem, so that it can be but slightly moved by the wind. If disturbed, the pupa gives a very sudden and violent jerk.

On July 4th the imagos commenced to emerge, and the last put in an appearance on July 13th. The proportion of the sexes were three males to two females. Some are curiously mottled, and the amount of purple iridescence varies greatly. I have this year taken in the Sussex woods males which were similarly mottled; this gives to perfect specimens an appearance of being weather-beaten.

The following list of dates indicate the chief transformations already mentioned:—1880, July 19th and 20th, females captured; 25th, eggs first noticed. August 11th, larvæ emerge; 21st, first moult completed. September 10th, second moult completed.

1881, April 12th, larvæ left winter quarters. May 8th, third moult completed; 26th, fourth moult completed. June 19th, many in pupa. July 4th, imagos first appear; 13th, last imago appeared.

I should mention that during the last week in June I discovered one larva, in plump condition and with good appetite, which apparently had not changed its skin since the winter; it was still of the dirty brownish green colour, and, except that it had filled out, it had not grown; this I hope to find when I put a fresh net over the bush, and shall then bag separately. If there be others in a similar state, it may happen that some larvæ of *Apatura Iris* take more than a year to complete the cycle of their existence. If this be so, why may not larvæ of other species be subject to similar retardation? and a fresh point would thus be added to the consideration of the periodicity of appearance of certain species.

Dartford, August, 1881.

EUPITHECIA JASIONEATA, Crewe: A SPECIES NEW TO SCIENCE.

By Rev. H. Harpur Crewe, M.A.

Some three years since I received from Mr. Ficklin, of Keynsham, near Bristol, specimens of a *Eupithecia*, which he had bred from larvæ taken the previous September, in North Devon, feeding in the seed-heads of *Jasione montana*. At first sight I was disposed to consider them a variety of *Eupithecia castigata*, and in this view Mr. Buckler, who also saw the specimens, concurred. I forbore, however, to give any definite opinion till I had seen the larva.

The same autumn Mr. Ficklin again took the larva in North Devon, and very obligingly forwarded specimens both to Mr. Buckler and myself. We at once saw that they bore no likeness whatever to *E. castigata*, but, though smaller and stouter, most closely resembled the larva of *E. campanulata*. As, however, the perfect insect was totally distinct from the latter species, I felt convinced it must be a species new to Britain.

Through the kindness of Mr. M'Lachlan the perfect insect has recently been carefully examined by M. Dietze, of Hamburg, who knows more probably about the continental *Eupitheciæ* than anyone else. He is unable to identify it with any known species, and considers it new to Science.

With the consent, therefore, of Mr. Ficklin, to whom the whole merit of the discovery belongs, I propose to name it *Eupithecia jasioneata.*

In general appearance the perfect insect closely resembles *E. castigata*, but the ground colour is a much paler ashy grey. The dark central lunule of the front wing is round, not narrowed; and before the hind margin there is a very conspicuous, almost uniformly broad, acutely angled, pale whitish line, which forms the most distinguishing characteristic of the insect.

Description of the larva of *Eupithecia jasioneata:*—Short and stout; ground colour pale ochreous-brown; central dorsal line dull olive-brown, interspersed with lozenge-shaped spots of a similar colour—the latter become merged into the central line on the anal segments; head blackish; spiracular lines indistinct, yellowish on each side, slanting brown markings. Whole larva wrinkled, rough, and sparsely studded with yellowish warts and hairs. Feeds in September on seed-heads of *Jasione montana.*

Perfect insect appears in May.

Drayton-Beauchamp Rectory, Tring, August 6, 1881.

A MONTH IN THE NEW FOREST.

By Reginald E. Salwey.

Early in July, the settled fine weather having tempted me down to the New Forest, I installed myself at Brockenhurst on the 8th of the month, with the determination of working the locality thoroughly until August. The first thing I noticed was the unusual abundance of the Diurni. As I strolled about the rides *Argynnis Paphia* rose in great numbers from the brambles, accompanied by almost as many *Limenitis Sibylla.* Both species were in splendid condition on the 9th, and the variety of the former, *Valezina*, equally fine, but not so plentiful as report had led me to expect. A good proportion of my specimens of this beautiful variety were taken *in copulâ*, of course with males of the ordinary type. It struck me at the time that *Valezina* differed considerably from the type of *A. Paphia* in its habits, being decidedly more alert on the wing, flying higher, and more wary than the typical females. All three of these butterflies appeared to suffer from the attacks of dragonflies, which took a savage delight in snapping pieces out of the wings of *A. Paphia* especially. The fiery colouring of the latter irritated them, I presume, and roused their pugnacious tendencies. A few days later *Satyrus Hyperanthus* abounded, and *Gonepteryx rhamni* almost rivalled *L. Sibylla* in numbers by the middle of the month. On the 29th I *saw* about a dozen *Apatura Iris* flying round high oaks and Scotch firs, but sticks, stones, and clods of earth availed not at all to bring their imperial majesties within reach of the long net I had provided for them. I believe a few specimens were taken at old sugar, but, as far as I know, very few on the wing. In all, I sighted twenty-four species of Diurni during my stay; not a bad percentage in a month, considering our limited British list.

Boarmia roboraria emerged rather early this year, and my specimens are consequently not in first-rate order. *B. repandata* var. *conversaria* proved scarce, and *Acidalia inornata* only put in an appearance at sugar, and then very sparingly; *A. immutata* no better; and although I devoted several mornings to "Bank" and "Denny," and worked hard for *Cleora glabraria*, I could not make up a half dozen, and was obliged to console myself with a few *C. lichenaria* and an unlimited supply of *Liparis monacha* off oak and beech; of these I took some handsome dark-banded forms.

This Geometer working was somewhat disappointing, *Ennomos angularia* (normal types), *E. erosaria*, *Macaria liturata*, *Fidonia piniaria* and *Melanthia albicillata* being the only other species worthy of note. The "footmen" I found represented by *Lithosia quadra*, *L. helveola*, and *L. complanula*. The first species was very abundant; I picked out more than a hundred pupæ of it from the crevices of oak trunks,—from which I have reared as many ichneumons as moths,—and afterwards the perfect insect came freely to sugar, as did *Nola strigula*, of which I also secured a good number at rest in the daytime. One expedition after *Zygæna meliloti* sufficed to procure me a nice series, and I was loth to take more, as the species is very hard worked, and I fear in danger of extermination.

I sugared persistently in Hollands Wood and New Park, and was rewarded by three *Triphæna subsequa*, *Leucania turca* ad. lib., a few *Diphthera orion*, *Acronycta ligustri*, *Epunda viminalis*, and three *Aventia flexula*, in addition to the usual crowd of common summer Noctuæ; but "Where is *Dicycla oo?*" was the cry of every collector I met with; when will this erratic species appear again? *Catocala promissa* first came to sugar on the 13th, and I have now upwards of thirty perfect specimens in my store-boxes. The almost equally beautiful *C. sponsa* abounded at Bolder Ford by the 22nd, and to bottle forty of this grand insect, as well as a few *C. promissa*, before I had occasion hitherto to light the lantern, was certainly one of my most exciting entomological experiences. Of other local insects in the Forest I have only to add single specimens of *Limacodes asellus* and *Acosmetia caliginosa*.

Sometimes I turned my attention to Brockenhurst Heath and the adjoining bog, which made a pleasant change in the collecting. On the heath I found *Pseudopterpna cytisaria*, the peat form of *Gnophos obscurata*, and *Selidosema plumaria*, plentiful in the day-time; and I had some good "spurts" after *Heliothis dipsacea*, which interesting insect was not abundant, and difficult to secure in good condition. There also *Hyria auroraria* turned up, and at dusk enough *Acidalia straminata* to make out a series. *Acidalia emutaria* was plentiful on the bog at sunset, a few *Leucania pudorina*, and towards the close of my visit one *Nudaria senex* only, and a nice lot of *Nonagria despecta*. *Geometra papilionaria* occurred near the Lymington River, and I have brought away a very fine series, some attracted by light, others found at rest by day, and after their first flight at dusk.

By the 1st of August the collecting dropped off, and I therefore devoted some time to larva beating, which seemed unprofitable; a solitary larva of *Acronycta alni* and three of *Stauropus fagi* are all I can report of consequence. *Demas coryli* larvæ were abundant. By means of the beating-stick I worried out some very pretty forms of *Sarrothripa revayana*; and by the time I furled my net on the 5th of August, and contemplated the shattered remains of my umbrella, I had ample reason to be satisfied with my first visit to the New Forest.

I must not omit to add that I am indebted to Mr. W. Harper for much valuable aid in my labours, and to the courtesy of Mr. W. Jobson for a knowledge of some special localities.

Runnymede Park, Egham, August 13, 1881.

COLLECTING IN NORTH DEVON.

By Richard South.

As far as I can learn, there are few resident collectors of insects in the whole district of North Devonshire. In a note from a gentleman at the United Services College, Westward Ho! I am informed they have a Natural History Society in that establishment, some of the members of which are aspiring entomologists. At Barnstaple I understood there were two gentlemen of that town who had collections of Lepidoptera; but I only met with one of them, and he was good enough to show me his collection, which consisted mainly of butterflies, and they were strong in the commoner species of the genus *Vanessa*. The insects were set and arranged more in accordance with individual fancy than scientific requirements. In his collection was a curious example of *Acherontia Atropos*, which at once caught the eye, and appeared familiar and yet strange. A closer inspection instantly revealed the cause of my imperfect recognition. *Atropos* was before me certainly, but, having lost its own hind wings, a pair of the posterior wings of *Papilio machaon* had been substituted; hence my momentary mystification. This "hybrid" was referred to in a recent law case by its manufacturer as "*Acherontia atropo-papilio-machaon.*"

During June I had a few days at Instow Sand-hills and Braunton Burrows, but at neither place did I see the particular insects for which I was searching, viz., *Micra ostrina* and *M. parva;* in fact, even the generally common moths were scarce at those places. South-westerly gales and much rain had, I expect, either destroyed or driven away insects from those exposed localities. The flora of the district is extremely rich, but I am quite unable to say from my own experience what species of Lepidoptera are to be found there.

Throughout the month of June I used sugar nearly every night in various inland woods and on the coast, always putting on the "mixture" at or before 8.15 p.m. while still light. Some nights the wind was blowing hard, on others it was quite still, but generally the evenings were warm. Moths were always numerous as regards certain species, such as *Triphæna pronuba* and *Aplecta nebulosa;* of the latter I once counted seventeen on one tree-trunk, but among the large number of this species which came under my notice I only detected one variety, and that not a very striking one either. *A. herbida* was fairly plentiful in one or two woods; it also turned up in my breeding-cages. *Thyatira derasa* and *T. batis* were both of frequent occurrence. The genus *Acronycta* was represented by *A. rumicis* and *A. ligustri* only. *Apamea gemina*, *Noctua brunnea*, *Hadena adusta*, and *H. thalassina* were all common, and now and then the banded variety of *Boarmia repandata* would enter an appearance, and was duly boxed; but I got most of my examples of this variety by mothing at dusk. One evening I netted four successively in fewer minutes. Occasionally I found a specimen or two at rest on tree-trunks in the daytime. I noticed this form of *B. repandata* is not so skittish when at rest or at the sugar as the normal type. I have even touched this variety when on a tree, and it has simply turned itself round; changed front, in fact, and quietly settled itself for another snooze. If one only passes within a yard or two of the typical form of this species, it is off and away. This difference of habit is curious, seeing that the variety is so much more conspicuous when at rest than the ordinary type; and would be of importance in separating the two forms into distinct species, if other circumstances did not point so conclusively to the contrary. I may add that I have also bred the variety from a very few larvæ which I took in the spring.

In my April and May notes I mentioned *Emmelesia affinitata;* I must now couple with it *E. alchemillata*, and state that both species were generally common among *Lychnis*.

Eupithecia pulchellata larvæ were very plentiful in flowers of foxglove growing on stone-faced embankments of hedgerows; the first lot were found June 7th. The appearance of the imago of this species was somewhat erratic; one or two specimens were met with early in May, then not again till about the middle of June, and a few more July 6th and later. Although the food-plant of *E. plumbeolata* was abundant in some woods, I got very few examples of the insect; these were mostly netted at dusk. *E. lariciata* abundant in larch woods. *E. debiliata* was common in those woods where bilberry grew, but the majority of specimens were worn before I found out the habits of the imago; however, I got a nice series in capital condition. I collected a lot of what I thought at the time were larvæ of this species, and was greatly disappointed to breed large numbers of *Ypsipetes elutata* and very few *E. debiliata* from them. It would seem that the larval habits of both species are very similar; I examined a few of the curled leaves first, and satisfied myself that they contained a "pug" larva, and then thought it would be shorter work to pick all the curled bilberry-leaves I met with; but the result was as related. By the way, the bilberry-fed *Y. elutata* seems to me uniformly smaller, more distinctly marked, and altogether a prettier insect than those fed on sallow.

Melanthia albicillata, *Melanippe galiata*, and *Eucosmia certata* and *S. undulata* were met with sparingly. *Cidaria populata* was a pest in most woods. *Hypena crassalis* occurred between the 5th and 20th of June; one or two examples were taken at sugar, but the larger number were beaten out of heather or netted as they flew along wood paths at dusk.

Botys terrealis was often beaten out of bushes in the neighbourhood of golden-rod, and about two dozen larvæ and pupæ of *Phycis subornatella* were found among wild thyme growing on rocks near the sea. Larvæ of *Pempelia consociella* and *P. tumidella* were found on oak, the former commonly.

In July, all the species mentioned as visiting the sugar last month, the genus *Hadena?* excepted, were to be taken; the only additions thereto were *Triphæna fimbria*, *Caradrina alsines*, *C. blanda*, and *Cosmia pyralina*. The *Caradrinæ* were more partial to flowers.

I was fortunate enough to capture *Toxocampa craccæ*, and to breed others from larvæ found earlier in the season. This insect is exceedingly local; its head quarters are not often invaded by the entomologist, or perhaps indeed by any one, as the particular spot is only attained at the expense of much labour. I do not know that I should have visited the place, only I had set myself the task of finding the species, and I determined to leave no likely or unlikely cranny unexplored. Of course there were places which from force of circumstances I was obliged to pass by without inspection, but these were few. The casualties to larvæ were various, only thirty-five per cent. reaching the perfect state. Emergence from the pupa takes place between 6 p.m. and 6 a.m. I have noted imagines drying their wings at various times between the hours named, but have never seen them so employed at any other time.

All the genus *Hepialus* were observed this month. *H. velleda* was found on the moor, but very local. *Calligenia miniata* was not very plentiful.

Cidaria populata came out in extra force the earlier part of this month, and assisted the more numerous *Y. elutata* in bewildering the collector and preventing the capture of the more aristocratic members of the Geometrina, supposing such to have been present.

About the middle of August the second brood of *Eupithecia pumilata* were obtained by beating furze-bushes, and towards the end *Larentia olivata* turned up. *Cidaria immanata* and *C. prunata* were not uncommon, neither was *Botys asinalis;* this last is an insect that requires breeding to get really fine specimens; I took a good number, but many examples were too poor in condition to be worth setting. In the foregoing notes I have not set down any of the Micro-Lepidoptera I met with, but will do so shortly in a separate paper.

12, Abbey Gardens, St. John's Wood, N.W., August 17, 1881.

INTRODUCTORY PAPERS ON *ICHNEUMONIDÆ.*

BY JOHN B. BRIDGMAN AND EDWARD A. FITCH.

No. II.—ICHNEUMONIDÆ (*continued*).

THE *Ichneumones platyuri* have been tabulated by Holmgren, as follows:—

A. Bend of the 1st segment of the abdomen elevated in the middle. - - - - Gen. 1. *Probolus*, Wesm.

B. Bend of the 1st segment of the abdomen not elevated, sometimes bicarinated.

a. Petiole of abdomen depressed, and slightly flattened above.

* Sides of scutellum immarginate. Gen. 2. *Eurylabus*, Wesm.

** Sides of scutellum entirely, or beyond the centre, marginated.

† Antennæ of male very strongly serrated within. Gen. 3. *Pristiceros*, Grav.

†† Antennæ not serrated, at the most slightly denticulated. Gen. 4. *Platylabus*, Wesm.

b. Petiole of abdomen somewhat thickened, rather depressed; spiracles of metathorax circular. Gen. 5. *Apæleticus*, Wesm.

Following Marshall's Catalogue *Probolus alticola* has been included in the table of *Amblyteles*; for reference the genus is also included in the above table, as Taschenberg, Holmgren, Tischbein and Brischke are not agreed with Wesmael in sinking his own genus, but it is not necessary to again refer to the species here.

EURYLABUS, *Wesm.*

A. Abdomen ovate or elliptic. Hind tibiæ and tarsi incrassated (male). Black; legs red; coxæ, trochanters and apex of hind tibiæ and tarsi, black. - - - - - 2. *dirus*, 7½—8 lines.
B. Abdomen linear or oblong-fusiform. Hind tibiæ and tarsi not incrassated.
a. Tibiæ and tarsi of hind legs entirely red or orange (male and female). Ring of antennæ, marks on face, thorax and scutellum, yellowish; legs red. - - - - 4. *larvatus*, 7½—11 lines (*h*, *t*).
b. Greater part of hind tibiæ and tarsi black; coxæ and trochanters black; rest of legs red. Scutellum and abdomen black (males and females).
* 3rd segment of abdomen transverse. - 1. *torvus*, 5½—6 lines.
** 3rd segment of abdomen quadrate. - 3. *tristis*, 5½—6½ lines.

Our four species of *Eurylabus* are all rare in Britain; *E. torvus* is the least so. Mr. Marshall gives *E. larvatus* as only reputed British, and although in Desvignes' Museum Catalogue (1856) he did not include it in his 1870 Catalogue. There are two beautiful specimens in the British Museum from Desvignes' collection, but of doubtful origin; last year, however, Mr. F. D. Wheeler bred three males from *Stauropus fagi*, whose larvæ were collected in the New Forest. *E. intrepidus*, Wesm., given by Marshall as a variety of *E. larvatus*, is now considered a good species; it is not British. On Wesmael's plate illustrating the Ich. platyuri, *E. torvus*, female, *E. dirus*, male and head magnified, are figured. *E. larvatus* is figured by Christ. Our four species have all been bred, from the following hosts:—

1. torvus, *Wesm.*	from	Lithosia rubricollis; Marshall.
2. dirus, *Wesm.*	„	Eriogaster lanestris; Sauveur, Marshall, Bignell, ? Wilson. Trichiura cratægi; Giraud.
3. tristis, *Gr.*	„	Trachea piniperda; Brischke. Dianthœcia capsincola; Brischke.
4. larvatus, *Christ.*	„	Dicranura vinula; Gir. Stauropus fagi; Wheeler.

PRISTICEROS, *Grav.*

Scutellum black, sometimes white at the apex; abdomen black.
Ring of antennæ, orbits of eyes, and two spots on the metathorax, white; legs black.
Brischke says the colour of the female is like the male, that the apical margins of 5th to 7th segments are narrowly white, but that the antennæ of the female are not serrated (male and female).
1. *serrarius*, 5½—6 lines.

This rare species—of which Gravenhorst wrote "an Europæum," and Wesmael knew only one specimen, captured near Diest—is beautifully figured, with an antenna magnified, on Wesmael's plate of the Ich. platyuri (figs. 7, 8). It was regarded by Marshall as only reputed British; there is, however, a specimen in the British Museum, from Desvignes' collection, which was taken by the late Fred. Smith in Coombe Wood, in 1839. It is doubtless to this that Wesmael refers when, in the N.B. to the explanation of his plate, he says: "Depuis l'impression de ma notice sur les *Ichneumones platyuri* (Bull. du 3 Déc. 1853), j'ai reçu une lettre de M. Walker, où il m'apprend que M. Desvignes a aussi découvert, aux environs de Londres le *Pristiceros serrarius*, Grav., ainsi que mon *Eurylabus dirus*, dont il connaît même les deux sexes." Brischke bred a male from *Boarmia consortaria* pupa; and the female, referred to above, was captured on August 20th, 1876.

PLATYLABUS, *Wesm.*

SECTION 1.—Thorax and abdomen blue-black.

Antennæ white-ringed; front legs pale. 4. *nigrocyaneus*, 4½ lines.

SECTION 2.—Abdomen black.

A. Hind legs black; antennæ white-ringed; scutellum black (a var. of female with pale apex). - - - 2. *tenuicornis*, 5 lines (*s*).
B. Hind femora red.
a. Antennæ of female white-ringed; apex of scutellum pale, sometimes black. Gastrocæli deeply sunk. 6. *pedatorius*, 4—5 lines (*s, l*).
b. Scutellum and antennæ (a var. of female, sometimes with 12th and 13th joints white above), incision of 2nd segment, or 1st to 3rd, reddish; a yellow spot at the apex of the cheeks against the mandibles. Gastrocæli almost obsolete. - *Thedenii*, 3 lines.

SECTION 3.—Abdomen black, all or some of the segments with the apical margins entirely or partly white. Scutellum entirely, or apex, white.

A. Greater part of femora, especially the hinder ones, black; antennæ of female white-ringed. - - 3. *dolorosus*, 4½—5 lines.
B. Greater part of femora red, or all red; antennæ white-ringed.
5. *variegatus*, 4½—5 lines.

SECTION 4.—Abdomen more or less red; apical segments not pale marked.

A. Thorax and abdomen more or less red or chestnut, as well as greater part of legs; antennæ of female white-ringed. **1.** *rufus*, 5 lines.

B. Thorax black.

a. Scutellum black; ring of antennæ white; 1st and 3rd and base of 4th abdominal segments red; legs nigro-fuscous.

13. *semirufus*, 3½ lines, female.

b. Scutellum white; apical margins of 1st and 3rd segments red; 2nd red, with a brown dorsal spot; front coxæ and trochanters marked with white; femora and tibiæ red, apex of hinder black.

9. *tricingulatus*, 3½ lines, male.

SECTION 5.—Abdomen red and black, with the apex marked with white. Scutellum white or whitish (except in Nos. 10 & 11).

Legs red; coxæ, trochanters and apex of hind femora and tibiæ black.

A. Gastrocœli obsolete; metathoracic spiracles linear.

Abdominal segments, 2nd and 3rd red, 1st and 2nd partly so; apex of 5th to 7th and ring of antennæ white.

12. *errabundus*, 4—4½ lines.

B. Gastrocœli distinct.

a. Metathoracic spiracles oval.

Segments, 1st to 4th or 5th, red; petiole often black; 6th and 7th extreme apical margins and ring of antennæ white.

7. *orbitalis*, 3½—4½ lines.

b. Metathoracic spiracles round.

* Scutellum white.

Segments, 1st to 4th or 5th, red; 6th and 7th white at the apex; antennæ of female white-ringed.

† Antennæ of male white-ringed. . - 8. *volubilis*, 3 lines (*l*).

†† Antennæ of male not white-ringed. - 14. *pactor*, 2½—4 lines.

** Scutellum black; sometimes red in *dimidiatus;* antennæ white-ringed; segments, 1st to 3rd, red (a var. of male in *nigricollis*, with 1st and part of 2nd black).

: 5th to 7th abdominal segments with wide white apical margins.

Thorax and hind coxæ more or less red; sometimes in the male black. - - - - - 10. *dimidiatus*, 3—4 lines (*t. l*).

:: 5th to 7th abdominal segments with narrow white apical margins.

11. *nigricollis*, 2¾—3½ lines (*a*).

This genus is rather rich in species, and as there is but little sexual variation in them this is not mentioned in the table. It is arranged by Holmgren according to the shape of the metathoracic spiracles (in some species they are circular), the absence or presence of metathoracic spines, the shapes of the scutellum and grastrocœli; we have preferred following Wesmael's colorational grouping, as more in uniformity with Desvignes' divisions, previously used in this family. None of our species of *Platylabus*, except perhaps *P. pedatorius*, can be called common; bright specimens of *P. dimidiatus*, which varies much as to colour, are amongst our most striking species. *P. Thedenii*, Holmgr., has been added to the British fauna (Trans. Ent. Soc. Lond. 1881, p. 145; Entom. xiv. 139); but as not half of the North-west European species are included in Marshall's Catalogue, doubtless many additions are yet to be made. *P. rufiventris*, a species which certainly ought to occur here and which has been bred from *Macaria liturata* and *Halia wavaria*, is well figured on Wesmael's plate of the 'Ichneumones platyuri Europæi' (fig. 10). The British species which have been bred are as follows:—

2. tenuicornis, *Gr.*	from	Platypteryx curvatula*; Brischke.
3. dolorosus, *Gr.*	„	Geometer; Brischke.
4. nigrocyaneus, *Gr.*	„	Fidonia piniaria; Rondani. Trachea piniperda; Rond. Plusia festucæ; Stephens.
6. pedatorius, *Fabr.*	„	Hybernia defoliaria; Brischke. Eupithecia sobrinata; Goossens (Giraud). E. nanata; Brischke. E. exiguata; Brischke. E. pimpinellata; Brischke. E. innotata; Gir., Brischke. E. subnotata; Golding-Bird. E. scopariata (Guinardaria)*; Gir. Pelurga comitata; Richter (Gravenhorst).
7. orbitalis, *Gr.*	„	Fidonia piniaria; Perris (Gir.). Lobophora sexalata; Brischke. Thera juniperata; Brischke. Melanippe fluctuata; Brischke.
8. volubilis, *Gr.*	„	? Psyche viciella (Stettinensis)*; Hering.
10. dimidiatus, *Gr.*	„	Melanippe fluctuata; Brischke. Depressaria heracliana; Boie. D. depressella; Rond.
12. errabundus, *Gr.*	„	Anticlea sinuata; Brischke. A. rubidata; Brischke.
14. pactor, *Wesm.*	„	Eupithecia absynthiata; Brischke.
Thedenii, *Holmgr.*	„	Emmelesia unifasciata; Elisha.

APÆLETICUS, *Wesm.*

Scutellum pale; abdomen red, in male base black; femora and tibiæ red, apex of hinder black, coxæ and trochanters of the female red; metathorax bispined; post-petiole closely punctured.

1. *bellicosus*, 3 lines.

The female of this species is beautifully figured by Wesmael. It is our only representative of the genus (Wesmael describes five species), and is apparently very rare in Britain. There is a single specimen in the British Museum from Desvignes' collection. We are not aware that any species of *Apæleticus* has been bred.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

ARGYNNIS ADIPPE *var.* CLEODOXA.—Mr. Turner, a brother collector, and I were at Arnside, near Grange, on July 16th, and had the pleasure of taking *Argynnis Adippe;* when what should turn out after a shower of rain but the variety described in Newman's 'British Butterflies' as *Cleodoxa*, in splendid condition. Should any entomologists passing through Lancaster wish to see the specimen, I shall be happy to show them the same.—G. LOTHAM; Briary Street, Lancaster, August 8, 1881.

APATURA IRIS *var.* IOLE, VANESSA ANTIOPA, AND XYLOMIGES CONSPICILLARIS.—I have been requested to give information of the capture of another specimen of *Apatura Iris* var. *Iole* by Mr. Packman, of Dartford, at the same place as the one mentioned by me last month, and a few days subsequently thereto. It is rather smaller than the normal insect. Also that a specimen of *Vanessa Antiopa* and two of *Xylomiges conspicillaris* were taken by the same collector; the former on 1st of April last, the other two in the following May.—E. SABINE; 17, The Villas, Erith, Kent.

"IS VANESSA POLYCHLOROS THE PROTOTYPE OF V. URTICÆ?"—With much interest I read the article under the above title in the August number of the 'Entomologist,' and have been tempted to make a few remarks thereupon. Whilst fully indorsing Mr. Butler's views respecting the mutual progenitor of *Vanessa Polychloros* and *V. urticæ* being *V. C-album*, it seems to me a significant fact in support of his interpretation of the case, that *V. C-album* is undoubtedly becoming scarcer in Great Britain, and is perhaps on the road to utter extinction. If this be the case it is not unreasonable to suppose that *V. Polychloros* and *V. urticæ* have structural or other advantages over *V. C-album*. One of these advantages may be the greater area of the wing, resulting from the absence of the characteristic indentations of *V. C-album;* for it is difficult to perceive how the peculiar contour of the wings in the latter insect can be an advantage to its possessor. It would be interesting to know whether *V. C-album* is becoming less common on the continent or elsewhere.—G. COVERDALE; 2, Cannon Street, City.

SPHINX PINASTRI NEAR IPSWICH.—I beg to inform you that I took *Sphinx pinastri* from a pine in the Asylum grounds, near

Ipswich, about 10 a.m. on July 22nd. I had sugared the tree on the previous evening.—F. W. AGER; Borough Asylum, Ipswich.

[A drawing of this insect was submitted to me for identification, and proved to be that of *Sphinx pinastri.*—J. T. C.]

HEPIALUS VELLEDA IN SURREY.—In June, 1880, I took, near here, a worn obscurely-coloured "swift," which looked to me very like *Hepialus velleda;* and on visiting the same locality on the 18th inst. I obtained three more examples, this time undoubtedly of that species. They were on the wing soon after sunset, rather later than *H. hectus*, and flew much in the manner of Noctuæ.—J. EVERSHED; Wonersh, near Guildford, June 20, 1881.

NOLA STRIGULA AT SUGAR.—At Abbot's Wood, Sussex, on July 14th of this year, this pretty little species was abundant at sugar; my friend Mr. Smallwood and I captured about forty specimens, most of which were in first-rate condition. We found it almost as abundant on the 19th, but not nearly so fine; and in another week it had almost disappeared. The local collectors were surprised to hear of its being so plentiful, as it usually occurs only sparingly. For the information of others who may take this species I may add that it should be killed as soon as possible after capture, as it decidedly objects to the confinement of the chip-box.—CHAS. F. THORNEWILL; The Soho, Burton-on-Trent.

ENNOMOS AUTUMNARIA, *Wernb.* = ALNIARIA, *S. V.*—During the month of August I have had the very great pleasure of breeding this fine and rare British moth from eggs procured from a female moth, taken at a gas-lamp, at Deal, by my friend Mr. Harbour, who most kindly sent me them last autumn. The eggs commenced hatching April 27th, and continued to do so at intervals till May 20th. They were fed on birch, and grew very slowly. By the end of June the earliest larvæ were full grown, and most curious and twig-like animals they are. I could hardly persuade some of my non-entomological friends that they were really caterpillars, until I touched them and made them move. The first pupated during the first week in July, and the last on August 12th. The first imago appeared July 25th; and to this date, August 17th, I have bred twenty-four magnificent moths. I was fortunate enough to secure a batch of fertilised eggs from two remarkably handsome insects, so that I have great hope of being able to supply this much-coveted insect to most of my friends next year.—W. H. TUGWELL; 3, Lewisham Road, Greenwich.

Boletobia fuliginaria.—I have another to record: a very fine male specimen was again taken, two days after that of our friend Mr. Wellman's, by Mr. Upton, of Bermondsey, and is now in my hands, and will be exhibited by me at the next Aquarium meeting.—J. Trimmer Williams; 23, Old Kent Road, London.

Boletobia fuliginaria.—I am happy to be able to add one more to the list of captures of the above rarity. My gardener took a female in a box, in a cellar at Lewisham which had been undisturbed for two or three years. Being in some doubt as to the insect, I trespassed on the courtesy of my neighbour, Mr. Jenner Weir, who was good enough to assure me of its genuineness without a moment's delay. Another empty cocoon was in the same box, but, though we have sugared and searched carefully, we have not been able to tempt its former occupant to our bottle. Both insect and cocoon are in an almost perfect condition, the antennæ only being slightly shortened.—Fred. W. Smith; Hollywood House, Blackheath, August 22, 1881.

Boletobia fuliginaria.—A few days ago I caught a small moth in a cellar on a very old box, and not knowing what it was I asked some of my friends. It proves to be *Boletobia fuliginaria*. —A. Noakes; 1, South Vale Terrace, Lewisham, August 8, 1881.

[This and the preceding appear to refer to the same species. —Ed.]

Food-plants of Acidalia immutata.—The larva of this species is, I believe, little known. Whilst collecting at Wicken Fen at the end of May this year I took two larvæ, one feeding on *Valeriana officinalis*, the other on *Spiræa ulmaria*. They spun up within a few days, and appeared as imagos at the end of June.—Gilbert H. Raynor; Hazeleigh Rectory, Maldon, Essex.

Coremia quadrifasciaria.—In June last a specimen of this local moth was taken by a friend of mine at Danbury, near Chelmsford, in Essex. This, I believe, is a new locality for it.—H. Cubison; 29, Jeffrey's Road, Clapham, August 12, 1881.

Eupithecia jasioneata, *Crewe*.—In June, 1878, I had the pleasure of rearing a long series of an *Eupithecia* which puzzled me much at the time. I sent several specimens away to correspondents as a new species or variety of *E. castigata*, with a query after them. The larvæ were found feeding on *Jasione montana* by my collectors, while they were working near Valentia, South-west Ireland, in September, 1877. I have this day received from Mr. A. Ficklin, of Bristol, four specimens of a "pug" which he calls *Eupithecia jasioneata* of Crewe. I immediately recognise them as identical with my specimens just mentioned. I did not see the larvæ my men found in Ireland, or I should have at once known they were of something new. The Irish specimens are a trifle browner than the English examples. The moth is easily distinguished from *Eupithecia castigata* by a uniformly broad white sharply-angulated line before the outer margins of the fore wings, and the central spot is more rounded than in *E. castigata.* —E. G. MEEK; 56, Brompton Road, London, August 22, 1881.

[Mr. Meek has given me an opportunity of examining the *Eupitheciæ* above mentioned. The Irish examples do not differ from those of Devonshire more than might be expected from two far apart localities, and they appear to be identical species. I remember that all the Valentia Lepidoptera collected at the same time were decidedly suffused with rich reddish brown.—J. T. C.]

TRIPHÆNA PRONUBA.—I see it noted that this is the "yellow under-wing year," *par excellence*, in the South of England, and its extreme and unusual abundance in the neighbourhood of Prestwich and the Manchester district generally leads to the conclusion that it is equally common over Great Britain this year. That they are a nuisance here is to use but a mild term. I notice that they are largely consumed by birds, hundreds of wings lying about testifying to this predilection. I have noticed fewer *Xylophasia polyodon* than usual this season.—J. COSMO MELVILL; Prestwich, August 2, 1881.

TRIPHÆNA SUBSEQUA.—On the 1st of July, 1881, I captured a fine example of *Triphæna subsequa* in my strawberry beds. I have since seen four other examples on the same spot, but, having no net with me at the moment, failed to secure them.—O. P.-CAMBRIDGE; Bloxworth, Dorset, August 1, 1881.

ACRONYCTA ALNI NEAR BURTON-ON-TRENT.—I have again the pleasure of recording a capture of the larva of *Acronycta alni.* It was beaten out of a low birch shrub by my friend the Rev. G. A. Smallwood, of Ashby-de-la-Zouch, during an excursion which we jointly made to-day to Cloud Wood, near Worthington, Leicestershire. The larva, a remarkably fine one, was full-fed.—CHARLES F. THORNEWILL; Burton-on-Trent, August 15, 1881.

DIANTHŒCIA CUCUBALI DOUBLE-BROODED.—It seems not generally known that *D. cucubali* is occasionally, at all events, double-brooded. I have just reared seven fine specimens from larvæ taken at Lewes about a month ago, having a few days previously taken an imago of the first brood in a somewhat worn condition. The fact is mentioned in Merrin's 'Lepidopterist's Calendar,' but I have not seen it elsewhere.—C. F. THORNEWILL; August 15.

TOXOCAMPA CRACCÆ.—During a recent tour through North Devon and Cornwall I called upon Mr. R. South, who had been collecting in the former neighbourhood for some time. He showed me, amongst other things, some remarkably beautiful specimens of this rare moth, some of which were then alive.—JOHN T. CARRINGTON; August 14, 1881.

LEPIDOPTERA AT DEAL.—It may interest some of the readers of the 'Entomologist' to know the result of a month's hard work entomologizing on the south-east coast, from June 26th to July 25th. The weather during most of the time was exceptionally fine and hot, and fortunately light S.W. winds. The sand-hill specialities were in force; *Lithosia pygmeola* was by no means rare, and in beautiful condition, as was *Melia anella*. This obscure species was to be found almost every evening running up and down the grass and rush-stems; it is supposed to breed in bees' nests, but I have never been able to verify this statement; it rarely seems to fly, but with half-opened wings scuttles about the tufts of grass. The fine weather was just suited for the very local *Acidalia ochrata*, and I succeeded in getting a very fine series: this species is hard to take really fine; it gets its fringes rubbed quickly, from the habit of going into the dense tufts of grass; the specimens I bred are larger than those caught in their natural habitat. *A. emutaria* was not rare if worked for, but, as my time was taken up with other things, I only took about ten specimens. Of *A. immutata* two only were observed; *A. imitaria* occurred sparingly. *A. interjectaria* was common. *Nyctegretes achatinella* was very local, but not rare in one spot. *Nonagria despecta* was extremely abundant by the sides of a rushy ditch, and with some very pretty forms of *Schœnobius forficellus*. A few specimens of *Scoparia lineola* occurred on old posts, and a few *S. pallida* were secured. *Platytes cerussellus* was abundant; and *Crambus alpinellus* occurred, but I was not successful in finding it. The prize of the sand-hills is *Nola centonalis*; this I worked for daily, and secured in all thirty-four fine specimens; I totally failed to obtain eggs from any of my captures, but a friend I had taken to the locality, and showed him how to work this species, fortunately got two pairs *in copula,* and from them he obtained ova; from these I have now a few larvæ feeding. I secured what I have every reason to hope will prove a good take of *Dianthœcia albimacula* larvæ, from the coast near Dover. Folkestone Warren produced a few *Acidalia strigilata,* from which I obtained a good batch of ova; the larvæ are now feeding on *Clematis. Botys lancealis* occurred sparingly, as did *Eupithecia subumbrata. Emmelesia albulata* swarmed in places, and wasted specimens of *Procris globulariæ* were flying in the hot sunshine. I sugared twice only; common sand-hill Noctuæ were abundant, but nothing of any note was taken, though the general captures were interesting. The coast-line from Folkestone to Ramsgate is all splendid entomological ground, great rarities turning up when least expected; but I have never had such a take of gems as I had on this ground in 1877, although I have worked the locality thoroughly each year since.—W. H. Tugwell.

Lepidoptera at Llandudno.—Being at Llandudno from July 14th to 28th I paid a little attention to the Lepidoptera of the district; but as my health was not good at the time, not so much as I otherwise should have done. On two days I visited the Penmaenmawr mountains in the hope of finding *Acidalia contiguaria,* but was quite unsuccessful, although on the right ground for it. I believe the species has never been searched for at night, but, from the nature of the ground, I think it most likely that if searched for with a lamp, in the same way that other species of the genus are collected, it would be taken in great numbers. Had there been a sufficiently late train back to Llandudno, I should certainly have tried the method. The mountains yielded *Larentia cæsiata* in abundance, and *Gnophos obscurata* and *Cidaria populata* less commonly, with two common species of *Scoparia;* but little else. Eight or nine species of butterflies occurred in the district, but none of any rarity: *Satyrus Semele* was perhaps the most abundant species, occurring in great profusion on the Great Orme's Head and other mountains, and less commonly on the sandhills, where, too, a large bed of nettles was almost black with the full-fed larvæ of *Vanessa Io.* The moths included *Pseudopterpna cytisaria,* faded to a "white variety," on a mountain at Penmaenmawr; *Acidalia promutata* on the Great Orme's Head; a very pretty dark-banded form of *Camptogramma bilineata*; *Emmelesia affinitata* and *E. decolorata*; *Eupithecia centaureata* and *E. absynthiata* on the sandhills; *Cidaria pyraliata*; *Eubolia palumbaria* very abundant; *Charæas graminis* on the sandhills. This latter species is evidently occurring in unusual numbers this year; it is now common in my own field, where I have not seen a specimen for some years. *Caradrina blanda* very common on ragwort flowers, and *Agrotis tritici* equally so on the sandhills; *Cucullia umbratica*; *Pyrausta puniccalis*, common; *Herbula cespitalis*, abundant and in fine condition; *Crambus inquinatellus* and *Phycis subornatella* on the Great Orme's Head, the latter very worn; *Rhodophæa marmorella* beaten out of sloe, and also at ragwort bloom on the sandhills; besides many Tortrices and Tineæ. I notice some of your correspondents complain of the bad season; my own experience is that it is decidedly the best we have had for some years.—Geo. T. Porritt; Highroyd House, Huddersfield.

Notes on Tribolium confusum and Priobium castaneum.—A few days ago, on looking over some specimens of Coleoptera received from Northumberland in October last, I found several little living beetles, which had no doubt emerged from the other specimens, and which I at first took for *Tribolium ferrugineum*, Fab.; but upon a more careful examination I find them to be *Tribolium confusum*, Duv. *T. confusum* may be distinguished from *T. ferrugineum* by its more depressed appearance, and by its antennæ being gradually thickened towards the apex; whereas in *T. ferrugineum* they have a distinct club of four joints. Mr. H. E. Cox, in his 'Handbook of Coleoptera,' gives *Priobium castaneum*, Fab., as rare. I have taken it twice this year in an old tree stump near Barnet, having obtained in all six specimens.—A. S. Olliff; 36, Mornington Rd., Regent's Park, Aug. 3, 1881.

Cladius viminalis Larvæ destructive to Nut-stubs.—The larvæ referred to in my note of last month under this heading (Entom. xiv. 188) are those of *Nematus* (*Crœsus*) *septentrionalis*, L., and not of *Cladius viminalis*. This has quite a different larva, which I know well; but I was hurriedly led into error by an incorrectly-named figure.—Edward A. Fitch.

Erratum.—*Acidalia circellata*.—In my communication, "Lepidoptera on Thorne Moor" (Entom. xiv. 181), for *A. circellata*, read *A. straminata*.—W. Prest; York, Aug., 1881.

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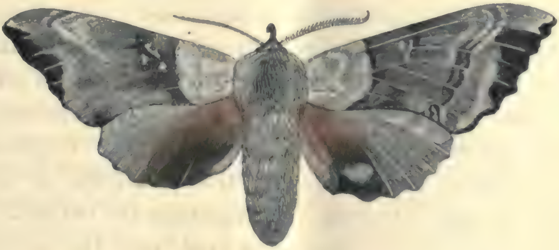
HYBRID HERMAPHRODITE OF *SMERINTHUS POPULI.*



Hybrid hermaphrodite of Smerinthus populi.

The ordinary hybrids between *Smerinthus ocellatus* and *S. populi* are not uncommon in collections, and occasionally one meets with hermaphrodite *S. populi;* but this is the only specimen of an hermaphrodite hybrid *ocellatus-populi* that I am aware of. I wish that I could give some information as to its history.

The specimen was purchased by me at the recent sale at Stevens' sale-rooms of the residue of Mr. Edwin Birchall's collection, on the 19th July last; but as Mr. Birchall has failed to give any details of the origin of the specimen, I cannot say from what source it came, or whether it was captured or bred; but from its condition, and from the fact that, so far as I know, no captured hybrid *ocellatus-populi* has ever been recorded, there can be but little doubt of its being bred.

C. A. Briggs.

55, Lincoln's Inn Fields, September 15, 1881.

NOTES ON THE LEPIDOPTERA OF THE OUTER HEBRIDES.

By J. Jenner Weir, F.L.S., F.Z.S.

The thanks of all entomologists are due to Mr. E. G. Meek for his further additions to our knowledge of the Lepidoptera of the remote islands of Scotland. Mr. Meek has had a collector at Lewis for thirteen weeks during the past season, and he has returned to London with a most interesting series of insular varieties. The collection was made at Stornoway, or within a radius of twenty miles of that port. The collection, although valuable and instructive, is not quite so interesting as that Mr. Meek had from the Shetlands last year.

The Outer Hebrides lie about 2° south of the Shetlands, and 5° degrees further west. The geological formation of the two groups is similar. The bulk of the Shetlands consists of gneiss rocks and granite; nearly the whole of the Outer Hebrides are of the same formation. In the peninsula of Eye, near Stornoway, granite obtains. Both groups are naturally treeless, but extensive plantations have been made near the castle, at Stornoway, and with the imported trees some of the insects captured have been introduced into the district. The Island of Lewis, in which the collection was made, with the exception of the Eye Peninsula adverted to, is a mass of grey gneiss rocks, with poor soil, and large proportions of peat and moor. The peat bogs are covered with *Myrica gale* and an abundance of *Osmunda regalis*.

Upon first examining the Hebridian collection one is struck by the fact that they present no resemblance to the Shetlandic, and that, especially amongst the Geometræ, the prevailing colour is grey.

The Shetlands are far more distant from the mainland of Scotland than the Hebrides. The isolation being greater in the former isles, the differentiation of species into local varieties has been more complete, probably in response to their environment, and also because immigrants from Scotland must be very rare, and a variety once localised would not be interfered with by crossing with the ordinary type. The Hebrides have certainly had the coloration of the Geometræ and other moths, which rest on the rocks during the daytime, very much affected by the grey colour of the gneiss. Those that most closely assimilated in colour to that of the rock would be less easily perceived by birds, and in the struggle for existence would have the better chance of preservation.

The unmarked species in the following list of fifty-eight captured are of the usual coloration as that which generally prevails in Scotland, and therefore do not call for any further remarks. Those noted with an asterisk present features of peculiar interest, and will be dealt with seriatim.

Chortobius Davus.
Lycæna Alexis.
Hepialus velleda.
*H. humuli.
Chelonia plantaginis.
Odontopera bidentata.
*Boarmia repandata *var.* Sodorensium.
*Dasydia obfuscata.
Scodiona belgiaria.
Fidonia atomaria.
*Larentia didymata.
*L. cæsiata.
*Emmelesia albulata and *var.* Hebudium.
Eupithecia satyrata.
E. lariciata.
E. nanata.
E. vulgata.
E. pumilata.
E. n. s.? in the hands of the Rev. H. Harpur Crewe.
Thera variata.
*Ypsipetes impluviata.
*Melanippe hastata.
*M. montanata.
Coremia ferrugata.
*Camptogramma bilineata.
*Cidaria russata.
C. suffumata.
Cymatophora or.
*Xylophasia rurea and *var.* combusta.
*X. polyodon.
Apamea basilinea.
A. gemina.
Rusina tenebrosa.
Agrostis suffusa.
A. porphyrea.
Triphæna orbona.
T. pronuba.
Noctua C-nigrum.
N. brunnea.
N. festiva and *var.* conflua.
N. baja.
Aplecta occulta.
Hadena adusta.
H. dentina.
H. thalassina.
Scoparia murana.
S. angustea.
Crambus pratellus.
C. margaritellus.
C. culmellus.
Tortrix icterana.
Pardia tripunctana.
Sericoris urticana.
Sciaphila penziana.
Phoxopteris unguicana.
Grapholitha campoliana.
Coccyx hyrciniana.
Catoptria ulicetana.

Hepialus humuli.—The specimens taken of this insect were males only, but they present the ordinary coloration of the species, and show no resemblance to the variety *Hethlandica*.

Xylophasia rurea.—A very fine series was taken, showing a number of intermediate varieties between the type and the variety *Combusta*. It would be impossible to describe the rich chestnut colour of some of these most beautiful specimens, and in many instances the ground colour is in strong contrast to the dark markings.

Xylophasia polyodon.—Probably so fine a series of this insect was never seen. The parallel variety to *Combusta* is of the richest dark chestnut-colour, very glossy, and, as in the case of *X. rurea*, the intermediate varieties are numerous.

Boarmia repandata.—This is one of the two most remarkable insects collected. The response to the environment is as complete as is found to be the case in *Gnophos obscurata*, with this difference, that the latter species frequents rocks, exposed chalk, sand and peat, when at rest, and its colours are assimilated to the prevailing colour of the geological formation. In England *Boarmia repandata* frequents trees when at rest, and its colour assimilates to that of their trunks; but in the Hebrides, where there are naturally no trees to rest upon, the insect has become differentiated to the colour of the gneiss rock, on which it rests in the daytime. Further it appears that this departure from the normal coloration is more pronounced in the female than in the male, the former more needing, in the interest of the race, to be protected. The whole of the specimens obtained are of a leaden grey colour, varied more or less with darker markings; in the females there is no trace of brown, and only by closely examining some of the males can a very faint trace be occasionally discovered; in fact the variety is as grey as *Tephrosia consonaria*, which it resembles both in colour and size, and being very much less than that of the type *Repandata*. This being a well-defined local variety, differing in colour and size entirely from the type of the species, I propose for it the subspecific name of *Boarmia repandata* variety *Sodorensium*.

Dasydia obfuscata.—The specimens captured are lighter than usual; in fact the females are almost of the same colour as some of the variety *B. Sodorensium*, showing that similar causes have produced like results.

Larentia didymata.—The specimens are dwarf, and present the grey coloration of the two species above mentioned, especially in the female.

L. cæsiata.—Another species of the prevailing grey colour of the Hebridean Geometræ; but as grey is the normal colour the differentiation is not very marked.

Emmelesia albulata.—None of the specimens resemble those captured last year in the Shetlands, but the insect occurs in the neighbourhood of Stornoway in two widely different forms; first there is the ordinary coloration, which is quite indistinguishable from that of Scotch and English specimens. A pure white variety has been taken in the proportion of about one to six of the normal form. I have never before seen an albino of a Geometer, except one that I possess myself of *Eubolia bipunctaria;* but this, which I took at Lewes, Sussex, is a mere accidental aberration. In the case of the purely white specimens of *E. albulata*, as several were taken, it is clearly a well-defined local variety, if it be not a species, for no intermediate varieties were found. I propose, therefore, that this variety should receive the subspecific name of *Emmelesia albulata*, variety *Hebudium.*

Ypsipetes impluviata.—The specimens are of an almost uniform grey colour, with the central light band found in the Southern form obscured, another instance probably of an insect assimilated in colour to its environment.

Melanippe hastata. — Those taken are much smaller than English specimens, are more strongly marked with black, and in some the upper wings have the ground colour of a very pale yellow.

M. montanata.—The whole of the ground colour of those captured is suffused with grey, and the specimens are far below the usual size, but they do not resemble those from the Shetlands in the breaking up of the central band into bandlets.

Camptogramma bilineata. — The specimens do not quite resemble those from Shetland, but differ in colour very much from the normal form; the primary wings, though not strictly grey, have the appearance of being washed with that colour, and contrast with the yellow of the secondaries; moreover, in all cases but one, the central band is broadly edged with black; the one aberrant variety is entirely clay-coloured, with the markings unusually faint.

Cidaria russata.—This variable insect is remarkably uniform in coloration in the Hebrides; many scores have been brought by the collector, but the variation amongst them is slight. Grey and black are the prevailing colours, and the usual red markings are but very faintly shown. All the specimens too are dwarfed. There is often seen amongst English examples of *C. russata* many more varieties from the eggs of one female, than the whole of the specimens from Lewis exhibited. I regard this as one of the most remarkable instances of a variable insect becoming uniformly of the colour of the rocks on which it rests.

Mr. Meek's laudable enterprizes of sending collectors to Ireland, Scotland, the Isle of Man, the Outer Hebrides, and the Shetlands have given an impulse to the study of local variations amongst the Lepidoptera of those localities. Far more interest attaches to such varieties than to mere aberrations, which may never be repeated, and are simply monstrous. Collections should be arranged to keep the specimens obtained from different districts distinct, so that where insects are affected by the geological condition of their surroundings it should be clearly shown.

There is another even still more interesting line of research in the collecting of insects obtained from the more northern parts of these islands, which may be put in a concrete form by taking *Cidaria russata* as an example. This insect is double-brooded in the South of England, but it is probably single-brooded only in the Hebrides. Now we find, in the genus *Ephyra*, that the two seasonal broods of some of the species differ materially in colour, but I am not aware that any one has pointed out any difference between the two broods of *C. russata*. If such a difference does exist, which form do the Hebridean insects most resemble?

In the case of *Pieris napi* the two broods differ very much in colour. I do not know how far the insect is found north, but apparently it is not an inhabitant of the Shetlands, nor Outer Hebrides; it is important to know whether there is any part of Scotland where it is single-brooded only, and whether, when this is the case, the specimens approach in colour to the alpine variety *P. bryoniæ*.

I am afraid our common insects are not sufficiently studied; *Pieris napi*, as Dr. Weisman has shown, is well worthy of attention. I should myself be very glad to obtain Scotch specimens of the insect, particularly of those captured in the mountains. If local variations and seasonal dimorphism were better shown in our cabinets, many drawers of common insects now passed over as hardly worthy of notice would, on the contrary, be deemed the most interesting and instructive part of the collections.

6, Haddo Villas, Blackheath, S.E., September 6, 1881.

SCOPARIA CONSPICUALIS, Hodgk.: A LEPIDOPTERON NEW TO THE BRITISH FAUNA.

By J. B. Hodgkinson.

Some ten years ago I took a specimen of this handsome species, when Mr. C S. Gregson was with me, at Windermere. At the time I observed its peculiar light appearance, when on the wing, which readily distinguishes it from any *Scoparia* but *S. pallida.* This may be easily understood by laying a specimen on its back. The under side is all alike, of a creamy satiny spotless white.

This season I have taken a nice series, and all that I have seen of the insect induces me to believe in its being a good species. I now, therefore, propose to describe it under the name of *Scoparia conspicualis*:—

Expanse of wings, male and female, 8 to 9 lines. Palpi light above, dark beneath. Tongue yellow; a conspicuous object. Eyes large, dark; head silvery grey; antennæ steel-grey, short; thorax and abdomen silvery grey. On anterior wings the first space with two basal lines, the lower line longest; the whole space silvery grey, very quaintly irrorated when examined under a low power; first line slightly circular; the orbicular stigmata oval, filled up with very faint ochreous; the claviform stigmata often linear or arched, and attached to the first line, often running well into the fold; the second space dark grey, irrorated with darker, and having well-pronounced marks on the costa above the reniform stigmata. This stigma varies in form: often it is K- or B-shaped, rarely 8; the B wanting part of top and bottom reads like 13. The second line commences with a rich dark grey patch below the costa pointing outwards, then inward to a little beyond the line which runs sinuously across the wing towards the base of the third space; bright light silvery grey, having very light faint irrorated patches, darkest near the margin, which has two rows of well-defined streaks (not dots) at the inner edge of the cilia, which is light coloured and long. Hind wings light silvery grey. General form rather broad. This species is intermediate between *S. ingratella*, Zell., and *S. atomalis*, Dbl. It sits triangularly, and may be known from any other of the genus when at rest by the peculiarly distinct light first space, standing out as a white dot on the tree the insect is resting on. Imago appears July and August.

Spring Bank, Preston, August 26, 1881.

[A figure of this species will be given in the November, or an early, 'Entomologist,' in a plate with other new British Lepidoptera.—Ed.]

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Varieties of Argynnis Paphia in the New Forest.—Having just returned from the New Forest, I think it may be of some interest to the readers of the 'Entomologist' to record some varieties of *Argynnis Paphia* which I had the fortune to take. The variety *Valezina* was common, but very few in good condition. I was very anxious to take this variety *in copulâ*, in order to see if there was a corresponding variety of the male; but although the ordinary type of *A. Paphia* were to be seen in great numbers coupled, yet I did not even see a male following *Valezina*. Is this variety sterile? Secondly, a variety of the male:—The upper surface like the type, but on the lower surface the silver streak nearest the base is a mere spot, and the next silver streak is entirely absent. The third variety was of the male:—The markings are typical, except that each wing has a pale straw-coloured patch; that on the fore wing occupies a space immediately behind the third black spot in the second submarginal row, and reaches onwards between the nervures to the next black spot; on the hind wing the pale spot occupies a space between the fifth gibbous spot and the median black line, enclosing the fourth round spot; the pale spots are visible on the under surface, but are not so distinct as on the upper.—H. H. Corbett; Ravenoak, Cheadle Hulme, Stockport, August 17, 1881.

LYCÆNA ADONIS IN SCOTLAND.—A specimen of this beautiful insect was taken last July by a boy, in a marshy place near a wood, a few miles from Oban. Being doubtful as to its identity, from its extreme northerly locality, it was taken to Mr. Prest, of York, who specified it. As this species is mentioned in Newman as "unknown to Scotland," and in Morris as only occurring "in some parts of Suffolk and other southern counties," it will be interesting to know whether it has since been found as far north. —L. STURGE; 20, Bootham, York, August 26, 1881.

VANESSA ANTIOPA.—A specimen of this butterfly was observed at rest, but out of reach, on a willow-tree, on the last Sunday in August, between Tottenham and Ponder's End. This specimen was seen near the place where one was captured last year, as recorded in the 'Entomologist' (vol. xiii., p. 240).—THOMAS EEDLE; 40, Goldsmith's Row, Hackney Road, E.

SPHINX CONVOLVULI AT BURTON-ON-TRENT.—I have the pleasure of recording the capture, in the midst of this busy town, of two specimens of *S. convolvuli*. The first was taken by Mr. T. R. Hallam, a young collector, in his father's garden, at 23, High Street, on the 25th of last month, at rest on an iron gate. The second was found on September 10th by a labourer while cleaning out a spout in Cross Street, and brought to another of our young collectors, Miss M. E. Day. The first specimen is in fair condition; the second a good deal rubbed, as might be expected from the locality in which it was found.—[Rev.] CHAS. F. THORNEWILL; Burton-on-Trent, September 13, 1881.

SPHINX CONVOLVULI AT NOTTING HILL.—This evening, whilst in a shop at Notting Hill, a carter brought in a fine female specimen of *Sphinx convolvuli* which he had found at rest on his cart in the morning. I am keeping the insect alive in the hope of securing eggs. Any hints will be very acceptable.—THOS. HUMBLE RALFE; Bayswater, September, 1881.

SPHINX CONVOLVULI NEAR YORK.—On September 9th a fine fresh specimen of *Sphinx convolvuli* was captured on some clothes hanging to dry in this city, and brought to me alive.—C. T. LONGLEY; 19, Lower Eldon Street, York, September 18, 1881.

CHŒROCAMPA CELERIO.—This evening, about seven o'clock, one of my sisters saw a moth buzzing about some fuchsias. Having missed it on the first stroke of the net, it returned in a few minutes fluttering over some geraniums, where, by a quick downward stroke, I managed to capture it. To my surprise and delight I found it was a good specimen of *Chœrocampa celerio.* It was raining rather hard at the time of capture. I caught it off the same flower-bed from which I took *Lycæna bœtica* on September 12th of last year.—Herbert E. Durham; 82, Brook Street, Grosvenor Square, September 11, 1881.

Acherontia Atropos in Manchester.—In the first volume of the 'Zoologist' (p. 31) one capture of a specimen of *Acherontia Atropos*, near Heaton Park, was recorded by Mr. R. S. Edleston. If the insect was rare in 1843 it may be safe to suppose that it is a still more infrequent visitor now. One was, however, caught in Bowker Street, Higher Broughton, on June 19th. I did not see it myself, but there need be no doubt as to the identity of the moth, its captor—Mr. W. R. Credland, sub-librarian of the Manchester Public Library—being quite familiar with the species. It was a small specimen, not more than half the size of one well developed. Members of the Bury Natural History Society have occasionally seen this moth at Manchester, Bury, Bolton, Bradshaw, and Birch, but it is marked in their lists as uncommon.—Wm. E. A. Axon; Fern Bank, Higher Broughton, Manchester.

Hepialus velleda in Surrey.—I might mention, in connection with a paragraph in last month's 'Entomologist' (Entom. xiv. 211), that a friend at Holmwood showed me a specimen of *H. velleda* which he took in a lane near Mickleham Downs, Surrey, about the beginning of June.—H. K. Harris; 2, Richmond Villas, London Road, Kingston-on-Thames.

Breeding Nola centonalis. — I have again succeeded in breeding this delicate and variable species. This year it is much earlier than in 1879, when I first met with it at Deal. In that wet and cold season my first capture was on August 15th, but this year they were nearly over by the 27th of July, and my larvæ commenced spinning up by the 4th of September. The larvæ this year fed up on clover. Evidently seasons much affect this insect. The first specimen I ever took was at Freshwater, Isle of Wight, on July 2nd, 1872, and that a worn female. In the cold season of 1879 I captured a virgin female as late as September 1st. Two months' difference! — W. H. Tugwell; 3, Lewisham Road, Greenwich, S.E.

DEIOPEIA PULCHELLA.—A fine specimen of *Deiopeia pulchella*, Linn., has just been added to my collection of Lepidoptera. It was taken by Mr. Howard Lacey (of Rylstone, Bournemouth) at Bestwall, near Wareham, several years ago, crawling up a muslin curtain in the drawing-room window. Mr. Lacey, having ceased to collect Lepidoptera, has very kindly enriched my collection with this beautiful and valuable specimen.—Rev. O. P.-CAMBRIDGE; Bloxworth, Dorset, August 26, 1881.

CALLIMORPHA HERA IN SOUTH DEVON.—It may perhaps interest some of your readers to hear that I caught a Jersey tiger (*C. hera*) in the Teignmouth Road, near Dawlish, on August 19th, about four o'clock in the afternoon. The insect, a male, is in good condition, with the exception of a slight tear in the right upper wing.—C. W. HERBERT; 6, Brunswick Place, Dawlish, S. Devon.

ABNORMAL ODONESTIS POTATORIA.—I have just received a specimen of *Odonestis potatoria* from Sheffield, with the wings the colour of the male, and with the antennæ of the female. The body is that of the latter, but not quite so large as an ordinary female.—J. R. WELLMAN; 219, Elm Park, Brixton Rise, Sept. 2, 1881.

PLATYPTERYX SICULA.—Through a persistent search amongst its food-plant since the early part of August, I am glad to say I have been enabled to secure larvæ of this species, which have safely pupated. I have likewise to report a fairly successful result from eggs obtained from moths bred at the end of May last; so perhaps correspondents who have not hitherto received this species from me will take heart at the announcement. I attribute my ill-luck this summer to an undue forcing of the pupæ, which previously I had not attempted, as on examination the moths were found fully developed.—WILLIAM H. GRIGG; 31, Cotham New Road, Bristol, September 17, 1881.

DICRANURA BICUSPIS AND ACRONYCTA ALNI IN NORTH STAFFORDSHIRE.—On Saturday, May 28th, I took a fine freshly-emerged *Dicranura bicuspis* off an alder-tree on Chorlton Moss, the same locality where three other specimens have been found in former years. This is, however, the first female that I have seen here, the rest having been all males. Three out of the four are in my cabinet, the fourth having been found (last year only) by my friend the Rev. E. C. Dobree Fox, Vicar of Castle Morton. I have tried to get the larvæ by beating the alders in August, but have hitherto entirely failed. On Sunday, August 28th, passing along a hedgerow within a couple of hundred yards of this house, my eyes fell upon a nearly full-fed larva of *Acronycta alni* curled up on the surface of a leaf of hawthorn. My sons the following day beat the hedgerow from end to end, but without further result. The larva pupated the same week in a dry piece of the hollow stem of *Heracleum sphondylium*. This makes the twelfth larva of *A. alni* I have had in my possession, all found within three miles of this house. So far they have produced seven imagos, which now adorn my cabinet.—[Rev.] THOS. W. DALTRY; Madeley Vicarage, Newcastle, Staff.

BOLETOBIA FULIGINARIA.—Since informing you of the capture of this insect (Entom. xiv. 212), I am happy to inform you that the other two, which I expected were in the same cellar, have both been captured. One is in the possession of Mr. Bond, and the other I have. Both were females.—FRED. W. SMITH; Hollywood House, Dartmouth Point, Blackheath, Aug. 27, 1881.

BOLETOBIA FULIGINARIA IN LONDON.—I am pleased to inform you that another specimen of *Boletobia fuliginaria* has just been taken (10 o'clock) in our warehouse in Thames Street, this being a female, and owing to its having been out some time is a little worn, but nevertheless a perfect specimen. There is a wide difference between the capture of my first (male) specimen, July 14th, and this one (female), August 25th.—J. R. WELLMAN; 219, Elm Park, Brixton Rise, S.W., August 25, 1881.

EUPITHECIA EXPALLIDATA TWO YEARS IN PUPA.—In September, 1879, I collected about eighty larvæ of *Eupithecia expallidata* from the golden-rod (which abounds here); from these larvæ forty-four of the perfect insects emerged during June, July, and August, 1880, and nineteen in the corresponding months of this year—1881. Were lepidopterists previously aware that a proportion of this insect remained two years in the pupa state?—[Rev.] O. P.-CAMBRIDGE; Bloxworth Rectory, Sept. 10, 1881.

[It is by no means of rare occurrence for pupæ of the genus *Eupithecia* to remain over to the second year. I know of an instance of *E. togata* pupæ producing moths in the third season. —J. T. C.]

CORÈMIA QUADRIFASCIARIA IN NORFOLK. — I think a few remarks on the occurrence of this local insect in Norfolk will not be out of place. I have taken the species in many localities in this county, and in the west and north-west of the county it seems to be generally distributed and in some seasons fairly common. This season I have been unfortunate in procuring the insect in good condition, but I have never observed it more plentiful. Indeed, although it may appear strange to some, I found the species, in a locality about eighteen miles from this town, one of the commonest of Geometræ; one, and frequently two or three, would start up at nearly every stroke of the beating-stick. As far as I have observed it has a preference for settling on the trunks of various trees, and often have I noticed it leave such situations at the approach of the collector, closely resembling in this respect *Boarmia repandata*. Undoubtedly the best method of collecting *C. quadrifasciaria* during the daytime is to strike the trunks of trees with a stick, and if in the locality where this method is adopted the insect will fly up to shift quarters for similar situations, and can then be netted or marked down again. It is also easily obtained by mothing at dusk, as it then flies freely. I think from what I have stated that Norfolk may be chronicled as amongst the best of localities for this species.—E. A. ATMORE; 8, Union Street, King's Lynn, September 17, 1881.

RANGE OF COREMIA QUADRIFASCIARIA IN THE EASTERN COUNTIES.—The occurrence of this species at Danbury, as recorded in the September 'Entomologist' (Entom. xiv. 212), is very interesting to Essex collectors. Would it not, however, be to the advantage of Entomology in general for anyone before publishing similar captures to collect information as to other places in the same district where the species to be noticed has occurred? It seems to me a lamentable lack in entomological literature that there should be no modern work recording the habitats of our rarer species. To read, as we do in Newman, that *C. quadrifasciaria*, for instance, has occurred in Suffolk, is scarcely satisfactory to one's feelings, if one wishes to invade the habitat of the species. Stainton's work was, doubtless, almost perfect when published; but the lapse of a quarter of a century has seen such strides made in Entomology that surely a new edition is called for. Failing this, could you not make it a speciality in the 'Entomologist' to publish from time to time lists of localities for some of our rarer species? It is difficult to conceive a more interesting point in connection with a species than its range of distribution in a small country like England. Such a knowledge would help us to determine the reasons for the extremely limited range of such an insect as *Acronycta strigosa*, whose food-plant is perhaps more widely distributed in England than any other tree. Now, with regard to the species recorded last month at Danbury, I believe, if records of its occurrence were collected, it would be found to be widely distributed in the Eastern Counties, but extremely local. Personally I have taken it this season at Brandon, and found it some ten years since not uncommonly at Harlow. My friend Mr. W. J. Cross, of Ely, has taken it at Stanstead (Essex) and at Cromer this season. It has also occurred more than once at Madingley, near Cambridge.—GILBERT H. RAYNOR; Hereward Hall, Ely, September 12, 1881.

ACRONYCTA ALNI NEAR LEICESTER.—On August 6th I found in my garden a larva of *Acronycta alni*. It is about an inch and a quarter in length. The larva was taken on a rose tree, on the leaves of which it continues to feed; neither whitethorn nor alder, its assumed food-plants, grow in the garden or near.—W. L. SALUSBURY; 130, London Road, Leicester, Aug. 12, 1881.

ACRONYCTA ALNI NEAR BURTON-ON-TRENT.—I had, on August 29th, 1881, a fine larva of *A. alni* brought me; it was found on elm; it has since spun up in a piece of dried peat, which I put into the cage.—GEORGE BAKER; Alni Villa, Ashby Road, Burton-on-Trent, September 19, 1881.

HECATERA DYSODEA IN NORTHUMBERLAND.—As Newman does not mention Northumberland as one of the counties where *Hecatera dysodea* has been taken, I think it may be worth while to record in the 'Entomologist' that two specimens have been taken at Heaton Hall, Newcastle-upon-Tyne, one last September and one on the 14th of this September, both coming to light.—Mrs. ROUTLEDGE; Stone House, Carlisle, September 15, 1881.

AGROTIS OBELISCA IN FIFESHIRE.—Although I have never noticed any mention of *Agrotis obelisca* having been caught in Scotland, I find it abundant in this locality, which is situated at the foot of hills close to the sea, always feeding in company with *Xylophasia polyodon*, and generally in pairs, on the common ragwort.—WILFRED W. O. BEVERIDGE; Rockville, North Queensferry, Fifeshire, September 5, 1881.

[In Dr. Buchanan White's 'Lepidoptera of Scotland,' *Agrotis obelisca* is stated to be "very local," and is recorded certainly from the "Forth" district, doubtfully from "Solway," and probably from several other of his divisions (Scot. Nat. ii. 281). In the same journal Sir Thomas Moncreiffe recorded this species as abundant on Moncreiffe Hill, Perth, and adds, "I think it has increased considerably in the last two years" (Scot. Nat. iv. 108; 1877). In Prof. Trail's 'Lepidoptera of the Dee,' we find "*A. obelisca*—once at Old Aberdeen" (Trans. Nat. Hist. Soc. Aberdeen, 1878, p. 36).—E. A. F.]

HELIOTHIS ARMIGERA IN GLOUCESTERSHIRE.—I had the satisfaction of capturing another, though rather weather-beaten, specimen of this Noctua, when at Wotton-under-Edge, on the 2nd of September. I was beating my way through some rough boggy ground on the top of the hills, searching principally for Hymenoptera, about mid-day, when a pale-coloured moth started up in front of me, which I took to be a *Lithosia*. It flew very softly some twenty yards on, and, noting whereabouts, I went on with what I was doing, intending to have another look at it. On my getting nearer I observed it settled on a bent with wings partially expanded and head *downwards* towards the ground, and seeing it was not what I expected I pushed through towards it, but it was off before I could get near enough to net it. It flew now only a very short distance, more in the open, and settled itself exactly in the same position again; I soon had it in my net, and found out what it was. Is it singular for a Noctua to settle head downwards? It was this very circumstance that attracted my attention to it. I might add, although the sun was bright there was a stiffish breeze blowing. Was this the reason; or do Noctuæ sometimes repose thus?—V. R. PERKINS; 20, Gloucester Street, S.W., September 16, 1881.

SCOPARIA CONSPICUALIS, *Hodgk.*, NEAR YORK.—Mr. Prest, of York, lately sent up to me for identification two specimens of a *Scoparia*, which prove to be Mr. Hodgkinson's new species, *S. conspicualis.* They were captured this season near York.—JOHN T. CARRINGTON; Royal Aquarium, S.W., September, 1881.

TORTRICES IN EPPING FOREST.—During the last week in

August I had the pleasure of taking, in one of its old localities, *Peronea cristana* in several varieties. *Semasia spiniana* was flying round the whitethorn-bushes in open glades about five o'clock in the afternoon.—THOMAS EEDLE; 40, Goldsmith's Row, Hackney Road, E.

PERONEA ASPERSANA (*Hübner*) INFESTING THE STRAWBERRY.—During June I received from Blairgowrie, N.B., some larvæ, which my friendly correspondent thought might prove to be that American pest, *Anchylopera comptana*, which has so much discouraged strawberry culture in various localities across the Atlantic. A few of these have developed into moths; and I have to thank Mr. Fitch for the identification of the species, which had not before, so far as I know, been observed upon the strawberry. That plant is, indeed, remarkably free from the attacks of lepidopterous larvæ, though it may appear to be liable to the visits of many that feed upon various species of the Rosaceous order. The food of *P. aspersana* is stated to be usually either *Potentilla*, dropwort (*Spiræa filipendula*), or salad burnet (*Poterium sanguisorba*); but if the increasing culture of the strawberry is likely to attract this species to it, and perhaps increase its numbers, it will turn out rather serious. At Blairgowrie the larvæ were noticed upon the plants in 1880, but they were still more prolific this year, destroying several acres, in spite of attempts to keep them under. The eggs, my correspondent thinks, are laid in the buds, the larvæ feeding during May and June; and he believes there is a second brood in September. The severe remedy of burning the surface has now been tried, and it is probably difficult to suggest anything short of this which would be of utility.—J. R. S. CLIFFORD; 13, Cambrian Grove, Gravesend, Kent, September 11, 1881.

RARE LEPIDOPTERA IN ESSEX.—I am glad to announce the capture of a nice specimen of *Argynnis Lathonia*; it was flying along a road at St. Osyth, and very considerately settled on the mud about a yard in front of me until I adjusted my net, and captured it; this was on September 14th. On the 9th I took a female *Colias Edusa* on the coast near Clacton-on-Sea, and hope to see other captures recorded, if any have been made, as the occurrence of isolated specimens in seasons when the species is scarce is of much more interest than the record of any number of captures when it is common. Four specimens of *Sphinx convolvuli* have been brought to me of late, but none of them have been fine.—W. H. HARWOOD; 8, West Stockwell Street, Colchester, September 20, 1881.

NOTES FROM RANWORTH FEN.—On August 15th I sugared, with my brother, in Ranworth Fen. The heavy and almost continuous rains of the week before had left the marshes in anything but a pleasant state for working, water lying everywhere, under the grass and sedges, three or four inches deep, and in many places forming large pools much deeper. We sugared the stems and leaves of some alder bushes, but our efforts were only rewarded by the appearance of one species, *Apamea fibrosa;* this was abundant enough, and we had taken twenty-five specimens, when an unlucky slip into a pool put a stop to sugaring for me that night. Besides the *A. fibrosa* we saw nothing but one *Plusia festucæ* and a couple of the ubiquitous *Triphæna pronuba.* The next day was dull and cloudy. We tried beating, and took on the marsh *Cidaria testata, Acidalia immutata, Phibalapteryx lignata, Crambus selasellus,* and *C. uliginosellus.* In the alder carrs we got *Epione apiciaria.* All the Geometers we saw were much faded and weather-worn. In the afternoon the sun came out for about a quarter of an hour, and with the sun appeared *Papilio Machaon.* We netted a couple, and saw two or three more; and afterwards my brother took another at rest on a reed. At dusk we netted *Nonagria fulva* and *N. despecta,* but the latter insect was going off in condition. We sugared that night in the very core of the fen, between two reed beds. We stopped till midnight, but took nothing except four *A. fibrosa, T. pronuba* always excepted. I was a good deal surprised to find this latter insect turning up so deeply into the fen. Up to August 8th, when the fine weather ultimately broke up in this neighbourhood, the past season had been a good one for entomologists, as it was generally in the Broads district. *P. Machaon* has abounded. One collector showed me a box containing fifteen dozen pupæ, taken in little more than a week. One imago which he bred remained, he declared, less than twenty-four hours in the pupal state. The same man showed me a board on which were set nine specimens of *Nonagria brevilinea,* some in fine condition; also a few *N. cannæ.*—C. CANDLER; Harleston, Norfolk, September 1, 1881.

Does Food produce Variation?—In the remarks that Mr. Butler makes touching Mr. White's paper (Entom. p. 178) he says, "I do not admit Mr. White's statement that food does not produce variation," and then instances Mr. Herbert Goss's experiments in the rearing of *Odonestis potatoria*. This year I have reared a quantity of *O. potatoria*, and, from my botanical ignorance of the grasses they fed upon, I have given to them the grass that was most handy—sometimes it came from Kent, sometimes from Hampshire, more often from the London parks, miles from where the larvæ originally came from. In no single instance have I succeeded in obtaining a departure from the normal type either in size or colour. Having made in rearing of larvæ the changing of food-plants a speciality, hoping thus to get varieties, I am enabled to speak with confidence on this subject. If the food-plant be chemically treated, or the larvæ be kept in other than natural conditions, then variable forms and colours may be expected, and dwarfs in size especially. This year I have had feeding between three and four hundred larvæ of *Arctia caja*; some idea of their number may be inferred from the fact of their devouring in ten hours a large cabbage and two lettuces. These larvæ were the majority of them taken at Willesden, from off the nettle and a bushy kind of shrub which the country people call the "snow-berry." They were reared on dock, dandelion, plantain, nettle, sallow, whitethorn, blackthorn, oak, and a host of other food-plants far too numerous to mention. The food was changed daily, and always differed from that of the previous day, yet in no case as yet has even a noticeable variety come out. Some months back, conversing with Mr. Bond on this subject, he remarked that some years ago a friend and himself had about five hundred larvæ feeding on various food-plants, with the hope of getting a variety, with the same results as myself. Thus far my experience is conclusively in favour of the theory advanced by Mr. White.—Thos. Humble Ralfe.

An Entomological evening at the Royal Aquarium.—After having been cut off from all intercourse with entomologists for several months, it was a great pleasure to me to drop into the Royal Aquarium, Westminster, on Monday evening last, September 5th, and meet so many entomological friends, and to delight my eyes by looking on the beauties which had been captured during the season, and were then exhibited in a galaxy of lepidopterous stars. The first box peeped into was shown by Mr. Farn: in it were some fine varieties of *Tephrosia biundularia*, a black *T. crepuscularia* from Wales; a series each of *Lycæna Corydon* and *L. Adonis*, showing interesting variations of under sides; a beautifully-marked variety of *Abraxas grossulariata*, also three curious Tortrices, the specific identification of which did not appear to be clearly established; one of these seemed to be a variety of *Spilonota lariciana*. Mr. Elisha showed a box of bred Tineina, among which were *Coleophora alcyonipennella*, *C. vibicella*, *C. conspicuella*, *Nemotois scabiosella* and *N. Schiffermillerella*, *Laverna Raschkiella*, *Gelechia maculella*, *Gracilaria semifasciella;* in this box were also examples of *Platypteryx sicula* and *Pterophorus microdactylus*. Mr. Machin exhibited a fine series of bred *Pteroxia caudella;* and Mr. Pratt examples of *Ephippiphora tetragonana*, *E. obscurana*, *Eupœcilia griseana*, *E. implicitana*, and others. Three fine specimens of *Boletobia fuliginaria* were shown, one a female, by Mr. T. Williams, and a male and female by Mr. Wellman. This gentleman also exhibited a series of bred *Arctia fuliginosa*, each example showing some slight variation of hind wings; also some very beautiful varieties of *Venusia cambricaria*. Mr. Brown's box contained, among other insects of lesser interest, two fine *Acronycta alni* and a specimen of *Catocala fraxini* bred from foreign eggs; the blue band of the hind wings seemed of a paler shade than in veritable British specimens. Mr. Graham showed a specimen of the dark form of *Limenitis Sibylla*. The new "pug," *Eupithecia jasioneata* (Crewe), *Nyctegretes achatinella*, *Penthina postremana*, *Coccyx pygmeana*, *Eupœcilia ambiguana*, *E. flaviciliana*, *Pterophorus lætus* and *P. Zetterstedtii* were shown by Mr. Meek; also a case of insects from the Hebrides, among which were some curious forms of various species,—*Boarmia repandata* of a stone-grey colour, *Emmelesia albulata* quite white and without markings, *Camptogramma bilineata* much suffused with black, *Xylophasia rurea*, examples of the var. *Borealis*, besides some nearly black forms. Mr. Carrington exhibited a new *Scoparia*, lent by Mr. Hodgkinson, of Preston, and named *Scoparia conspicualis;* also some fine varieties of *Boarmia repandata*, one of which was especially beautiful; an example of *Argynnis paphia* of ordinary markings, but with a whitish blotch of irregular shape near the centre of each wing; extraordinary varieties of *Cosmia trapezina* of an orange colour; a dark variety of *Cleora glabraria;* a curious aberration of *Venilia maculata*, on the right posterior wing of which was a blackish dash extending from the base to the middle of hind margin; and a banded variety of *Amphidasis betularia;* besides which were several other rare species. Mr. Eedle showed a box containing *Meliana flammea*, *Nonagria Hellmanni*, and *N. arundineta;* and Mr. Wailly, a fine box of *Papilio Philanor*, *Sphinx quinquemaculata*, &c., and several silk-producing Bombyces, with their cocoons; and living larvæ of *Ceratocampa imperialis* were shown by Mr. Wailly, as well as other larvæ of rare exotic species, all of which had been reared in Mr. Wailly's garden; these included the American *Orgyia leucostigma*, first reared in this country; also fine cocoons of *Attacus Cynthia*, *A. Pernyi*, and those of a new hybrid between *A. Roylei* and *A. Pernyi*. In my own exhibition box were examples of *Toxocampa craccæ;* banded varieties of *Boarmia repandata;* one specimen of an *Eupithecia*, probably new; a *Dicrorampha* new to Great Britain; and one not identical with, but closely allied to, *D. alpina*; also a "plume," probably new. There were many other boxes of insects shown; but memory and space precludes further mention of them. To the kindness of Mr. John T. Carrington is due the origin and success of these monthly meetings. In May, 1878, the now familiar invitation first appeared on the cover of the 'Entomologist,' and but few "first Mondays in the month" have passed since that time without a goodly gathering of entomologists at the Aquarium, varying from twelve to forty-five in number; neither has there been an evening without interesting exhibits of insects and discussion.—Richard South; 12, Abbey Gardens, N.W.

Phædon betulæ (*Sharp's Cat.*).—Observing Mr. Hart's enquiry respecting the food-plant of *Phædon betulæ* (Entom. xiv. 187), I was surprised to find that in reply to his query it was spoken of as being generally abundant in watery places. I am not for one moment going to dispute such authorities as my friends Mr. Fitch and Dr. Power; but as my experience of this Coleopteron is quite contrary to the aforesaid gentlemen, it may not be uninteresting to give it:—*Phædon betulæ* is one of the greatest insect pests the market gardeners around London have to contend with. Having grown horseradish for some twenty years for the London markets, it has been my lot, unfortunately, to have my attention frequently called to this pest, particularly in hot dry seasons: it attacks the leaves of the horseradish when about eight or ten inches in height, and if not speedily destroyed it will in a very short time sweep over a large tract of land, leaving nothing of the leaf, but the stalk standing upright, and looking like a dried-up lot of sticks, the result being that the plant becomes weakened and gradually dies, and this on land where there is no water near, unless, indeed, in the drain-pipes underneath the surface. I have seen the leaves literally black with this obnoxious insect; and as gas lime, slacked lime, soot, salt, and many other special fertilisers do not seem to make any impression on it, the only remedy appears to be fire; at least this is my experience, having during that time had to burn some acres of land to get rid of the pest. In the year 1878, on about two acres of land at West Ham, which we had to burn, it was accompanied by *Thyamis ochroleuca*, Marsh, in almost as great abundance as the *Phædon* itself. It is also very destructive to radishes when in the seed-leaf, clearing the ground as it goes, unless the weather happens to be very showery, and thus helping the plant into the rough leaf, in which state it seems to defy its enemies. I should say this appears to be the small form, and I think less likely to be found near water than the species with callosities Dr. Power speaks of. I do not find mention of this insect in Miss Ormerod's valuable 'Manual of Injurious Insects;' this is the more remarkable, as she has given so great attention to insects more particularly injurious to agriculturists.—T. R. Billups; 4, Swiss Villas, Coplestone Road, Peckham.

[If Mr. Billups will refer to the article in the 'Entomologist' (Entom. xiv. 187), we think he will find that there is no real discrepancy between his own account and the statement of Mr. Fitch and Dr. Power; but the difficulty seems to lie in a misapprehension of the synonymy as there stated. *Phædon betulæ* of Sharp's Cat. is NOT the insect Mr. Billups alludes to, but is the larger one with callosities on the shoulders, called *P. armoraciæ* in Wat. Cat., and stated to be less common, but perhaps more aquatic. The species which Mr. Billups means to speak of is the small round one, the *P. betulæ* of Wat. Cat., but called by Dr. Sharp *P. cochleariæ*, and which, in the article alluded to, is stated to be "more common, less aquatic, and to have been seen utterly destroying a crop of horseradish in a garden;" agreeing *entirely* with what Mr. Billups says.—Ed.]

CAPTURES OF ACULEATE HYMENOPTERA.—At the commencement of July I took a male of *Crabro scutellatus* (= *pterotus*) on Wimbledon Common, at the back of the running deer butt. On August 1st I captured a splendid female of *Hoplisus* (*Gorytes*) *bicinctus* in the neighbourhood of this city. Aculeates have been scarcer than ever this season, at least in my neighbourhood. As a specimen I give the result of my last three half-days' observations, excluding wasps and Bombi: I saw one male *Cilissa tricincta*, two males and one female of *Andrena dorsata*, perhaps half a dozen small *Halicti*, one male *Megachile centuncularis*, the above-mentioned *Hoplisus*, and a female of *Crabro cribrarius*. This is by no means exceptional, for the same paucity of aculeate Hymenoptera has prevailed throughout the whole season for the last three or four years; each succeeding year has been worse than the previous one.—JOHN B. BRIDGMAN; Norwich.

SCARCITY OF ACULEATE HYMENOPTERA ROUND LONDON.—Having been out on several occasions in various parts of Surrey and Kent in search of aculeate Hymenoptera, and meeting with hardly any success, although the places visited are celebrated localities for these insects, I should be very glad to hear that other collectors have been more fortunate. My own opinion is, that the late severe winter and cold spring have told very much upon the *Andrenidæ* especially. With the exception of taking a very few at Sevenoaks at Easter, I have hardly found any. *Bombi*, on the other hand, have been rather plentiful. Other aculeates have, like the solitary bees, hardly put in an appearance, notwithstanding the tropical heat we have lately endured. Saw-flies, too, seem very restricted in numbers. I hope others can give a better report from other localities, which it would be interesting to have in an early number of the 'Entomologist.'—V. R. PERKINS; 54, Gloucester Street, S.W., July 22, 1881.

GREAT SCARCITY OF WASPS IN KIRKCUDBRIGHTSHIRE.—Last year, as I recorded at the time (Entom. xiii. 223), this county had to endure a veritable plague of wasps. The winter of 1880-81 was exceptionally severe here, as elsewhere throughout Britain, and the spring was very cold and protracted. Excessively hot weather, for the period of the year, commenced about May 8th, and continued till the end of the month. During this time the large female wasps—almost all *Vespa vulgaris* and *V. germanica*—

came forth from their winter quarters in extraordinary numbers. Along the hedge-sides, and in the woods and plantations, they were as plentiful as ever I saw the workers on a hot August day. The most serious alarm prevailed amongst gardeners, bee-keepers, and all whose "crops" were likely to be affected by the plague of wasps which seemed inevitable, and paragraphs on the subject appeared in the local newspapers. There seemed every reason to fear that the wasps would be a hundredfold more numerous than in 1880; but simultaneously with the advent of the cold wet weather that set in about June 2nd, and has continued since without intermission in this district, the wasps disappeared; and since then I do not believe I have seen a total of fifty examples. What was the reason of this disappearance? I scarcely think this can be wholly attributed to the cold wet weather, but undoubtedly that was the chief cause. I am of opinion that many of the female wasps were barren, and never commenced to form nests. The summers of 1877 and 1879 were wet and sunless, and there were almost no wasps; while the summers of 1878 and 1880 were very fine seasons, and wasps were exceptionally numerous.—Robert Service; Maxwelltown, Dumfries, August 16, 1881.

Forficulidæ.—Those species which compose this little group of insects are placed by some naturalists under the order Orthoptera, while others consider that they possess such distinctive features as to render them of sufficient importance to form a separate order, and have thus termed them the Euplexoptera. Whether they are entitled to this position in Science it is not my object now to discuss; but, as these insects are this season so extraordinarily abundant in our neighbourhood as to cause them to be quite a pest, perhaps a short account of their doings may be of interest to some of the readers of the 'Entomologist.' Their fondness for dahlias is well known to every horticulturist, and therefore it is not surprising that they have this summer vigorously attacked these plants. In one bed our "traps" daily yield large quantities, and still they come as numerous as ever, devouring the buds long before the flowers are visible, thus effectually destroying the object of the gardener. They have also taken possession of some picotees, where some may be found in every flower. The entomologist at night finds them a source of much annoyance. Sugaring some trees in our garden, a distance of 12 feet apart for a length of 100 yards, we find on every patch of sugar a score or two revelling upon the sweets; nor do they stop there, but even ascend the street-lamps; and so, when adopting this mode of collecting, one is certain to net more earwigs than moths. They also intrude in our dwellings, where woe be to the entomologist who leaves his setting-house within their reach, as they seem to possess a great liking for his specimens. Unfortunately I can give testimony upon this point; after entering the house the *modus operandi* is to pass along each setting-board, and to cut off all the antennæ without otherwise injuring the insects; on one occasion in two days a single earwig removed thirty-six pairs belonging to *Diloba cæruleocephala*, while about a dozen other sorts that were upon the same boards remained untouched. This season one again managed to elude my vigilance, but happily was detected before doing much mischief, the choice this time being some rows of bred *N. dictæa*.—H. T. Dobson, jun.; New Malden, Surrey.

United Field Naturalist's Society.—A numerously attended meeting of this Society was held on Sunday, September 11th, at Middleton, near Manchester. After several interesting discussions on botanical, ornithological, geological, and other subjects, the meeting adjourned for luncheon. On reassembling Mr. J. Thorpe, of Middleton, read a long and carefully prepared discourse upon "Insects injurious to plant-life." He divided his subject into sections: such as foliage feeders, insects detrimental to fruit, ornamental flowers, wood-borers, &c. After enumerating a large number of insects looked upon by man as his enemies, Mr. Thorpe explained some of his experiments with Nature's natural check upon these creatures, *viz.*, the ichneumons. A long discussion followed upon the points raised by the essayist, and a cordial vote of thanks was passed to Mr. Commissioner Thorpe for his paper. We need not point out the advantage of these periodical gatherings of naturalists in our great manufacturing centres, nor to the elevating influence they have upon many who would otherwise take little interest in matters scientific.—Ed.

Erratum.—In the editorial note on *Boletobia fuliginaria*, p. 212, for "species" read "specimen." P. 196, l. 7, for "inches" read "lines."

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URANIA SLOANUS AT HOME.

BY P. H. GOSSE, F.R.S.

No. II.—THE LARVA AND PUPA.

IN the 'Entomologist' for June, 1880, appeared some pen-pictures of one of the most elegantly-formed and most richly-coloured of exotic Lepidoptera. From the same careful observers I can now describe the transformations of this fine insect, which, though it is a denizen of one of the oldest British colonies, have to this time remained unknown.

My friend, the Rev. J. L. Mais, had written to me as follows, from Walton, Jamaica, under date of July 6th, 1880:—"We are now highly interested in watching some curious larvæ, which we have reason to believe are those of *Urania Sloanus*. They were found at a spot near the coast, which a week ago was swarming with *Uraniæ*, all in much battered condition. The caterpillars suspend themselves in the air by a long silken thread, having the power to descend, hereby, from trees forty or fifty feet high, to the ground; and back again, when disturbed.

"The larvæ, when ready for change into the pupa-stage, weave a silken net, including therein gnawed fragments of the leaves they have been feeding on, and pellets of their own fœces.

"We cannot be sure that we have lighted on the larva of *Urania*, but it seems probable. The imago is in multitudes here at present; and generally in perfect condition. In some places they hang on the branches three or four feet from the ground, like swarms of bees!"

A fortnight later my friend thus wrote:—"All doubt on the subject has been dispelled. This morning came into being the first *Urania Sloanus* that has been reared from the larva. It assumed the pupa form on the 7th instant, having been fed on the leaves of what we know as the wild walnut." My correspondent, with excusable pride and enthusiasm, enters into many minute details of the appearance of his new-born treasure, and of his manipulation of it. These, though interesting, I will not repeat; but rather quote some further observations made on the larvæ in a state of freedom.

"On the 12th [of July, 1880] my son and I rode down to Bogue Bay, near Ocho Rios. It is a pretty little bay, wooded to the water's edge; the trees, in many instances hanging over the beach. From some branches we saw several of these black and white caterpillars, letting themselves down by a single silken thread, *until they touched the salt water*. There they would remain a few seconds, enjoying their sea-bath, and then they would haul themselves up again to the leaf they had selected as their temporary home. If touched, they would let out the thread with great rapidity.

"On closer inspection we observed some trees,—known by the fishermen around as the wild walnut,—with large almond-shaped leaves, covered with these caterpillars, of different sizes, all feeding greedily. Many of the trees had been denuded to the very leaf-stalks, and then forsaken by the larvæ for fresh food.

"It was curious and interesting to notice how these hairy caterpillars abounded. Some were crawling on the sand; some floating in the sea, at the mercy of the tiny wavelets that broke upon the shore. All, however, seemed quite happy, and at home, whether on land or sea. These fortunate creatures appeared to us to have no enemies. A fisherman close by told me that what we saw was nothing to the number he had seen two days previously. The trees, he said, were black with them; and he added that, every year, about the same time in July, these caterpillars are found wherever the wild walnut grows. I may add that, four days later,—on the 16th,—we revisited the spot, but not a trace of larvæ or pupæ was to be found!"

My correspondent kindly sent to me the empty puparium within its loose cocoon, affixed to the surface of a broad, ovate, leathery leaf, and several larvæ of different sizes, preserved in alcohol. He also inclosed a perfect leaf, of what he calls the wild walnut. I had supposed that this would prove the *Picrodendron juglans* of Grisebach; but Sir Joseph D. Hooker assures me that it is not that species. The material was in fact insufficient for determination, which had to be deferred till another season should enable my friend to remit me a specimen with flower and germen. This he has now done with more larvæ and pupæ; and the plant proves, on the same high authority, to be no other than the euphorbiaceous cob-nut, *Omphalea triandra*, which Mr. Macleay gives as the food of the allied *Urania Fernandinæ* in Cuba; a tree whose polymorphic leaves may well excuse the fisherman's mistake.

I have now but to add careful descriptions of—

THE LARVA AND PUPA OF URANIA SLOANUS.

Of the LARVA the general figure is that common to many caterpillars, especially among the Bombyces and Noctuæ, the segments nearly cylindric, and equal in thickness throughout; carrying four pairs of prolegs, besides the anal pair. The head is smaller (but not conspicuously) than the first thoracic segment, from which it protrudes without the intervention of any neck, such as that common in Hesperidan larvæ: it is marked from occiput to lip by an indentation. Its colour is uniformly a reddish fulvous; smooth; each cheek carrying six simple ocelli, arranged thus: five in a bow, of which the central three are larger than the rest, and one on the cord of the bow.

The body is black, with a rather broad band running down on each side of the middle through the entire length. This band consists of two lines of white, somewhat irregular and interrupted, joined by numerous cross lines still more irregular. The effect produced is as if two lines of Hebrew, the modern square character, had been written in white paint all down the black back. The median line, which, in my examples in alcohol, is as black as the rest of the ground-colour, is described by Mr. Mais as blue in the living larva. Down each side, including the spiracles, is a single slender white line, much interrupted. The ventral surface is black, bounded on each side by a broad band of yellowish white, which includes the fulvous legs, and the white prolegs. Each segment appears to carry a whorl of long, very slender, fusiform hairs, black for their basal half, white for their terminal. These are probably deciduous; since in the younger examples they are the more numerous; few and sparse and inconspicuous, however, at best. Length of larva about 1·75 inch; thickness 0·25 inch; when full-grown.

The Pupa, in general outline, can scarcely be distinguished from that of an ordinary Noctua; each abdominal segment bears a whorl of minute blunt points; the anterior wing-covers alone are visible; on these all the nervules are traced in black, on the red-brown hue which else is general; surface polished. I observe that a silken thread, attached to the anal point, floats to some distance (half an inch or more) in the preserving fluid. This thread readily catches any object as a pin or stick, and is so tenacious that the pupa can be pulled out and suspended in the air by it alone. Length 0·85 inch; greatest width 0·27 inch.

Between these larvæ and pupæ of *U. Sloanus*, and those of *U. Fernandinæ*, described and figured by Macleay (Tr. Zool. Soc. i. p. 186, pl. 26), there is considerable diversity. The former, though of like length, is much more slender; the red hue of the head is more uniform, and much duller; and, though the black and white of the body vary much, in relative proportion, in individuals, yet the black decidedly preponderates; in many examples to the almost total evanescence of the white; and thus the contrast of the prothoracic with the following segments is much less conspicuous. The pupa is of a deep chestnut hue; and the wing-cover does not sensibly project from the general outline, as it does in Macleay's figure.

The outline of the pupa well agrees with that of *Corinidia* (?) *Orithea* figured by Prof. Westwood (Tr. Zool. Soc. x. pl. 85, fig. 2); save that its thickness from back to breast is proportionally less; the facial parts are less prominent; there is no deflexion of the terminal segment; no spine; and the tongue-case is not lengthened beyond the wing-cases.

The figure of the larva (Ibid. fig. 1) very well agrees in outline with *U. Sloanus*; if we double the dimensions of the head and prothorax, and omit the spines and tubercles of the body.[*]

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[*] Sganzin's description of the larva of *Rhipheus* will by no means serve for *Sloanus*. The body is certainly not stouter in the middle; but, as nearly as may be, equally thick throughout. I recognise a certain likeness to a Geometric caterpillar, though, as he notes, the prolegs are fully developed.

There is no striking likeness to the plump downy caterpillar of *Pygæra bucephala.* Save for the sparsely scattered hairs the surface, carefully examined with a powerful lens (in spirit), appears perfectly smooth.

Sandhurst, Torquay, October, 1881.

ON SILK-PRODUCING AND OTHER EXOTIC BOMBYCES REARED IN LONDON IN 1881.

By Alfred Wailly.
(Membre-Lauréat de la Société d'Acclimatation de France.)

Again I have to complain of the weather. During the month of July, when the weather was magnificent, I had the largest number of larvæ I ever possessed: the trees in my garden were literally covered with them, and I had others on branches with stems in water. At the end of July larvæ of several species had nearly reached their last stage, and I expected a fine crop of cocoons. Then came August, with its tremendously heavy, incessant and cold rains, which lasted for several weeks, and destroyed all the good work done by June and July. Very few larvæ could resist the atrocious weather of August, 1881.

For the first time I reared *Actias Selene*, from India, in the open air on a nut tree, till the larvæ reached their last stage. On the same nut tree were reared larvæ of *Telea Polyphemus*, *Samia Cecropia*, from America, and hybrids obtained by the crossing of *S. Gloveri* (female) with *S. Cecropia* (male), and *Cecropia* (female) with *Gloveri* (male).

Samia Gloveri, from Utah, was reared during the first four stages in the open air on a wild plum tree; then on branches of *Salix caprea.* Several other species were reared in the open air, of which I shall mention *Attacus Atlas*, which I reared, or rather attempted to rear, on the *Ailanthus*, but the bad weather compelled me to remove the few remaining larvæ from the tree about the first week in September, when they had just reached the third stage.

The larvæ of *Samia Cecropia*, *S. Gloveri* and *S. ceanothi* are very much alike, and hardly any difference can be observed in the first two stages. In the third and fourth stages the larvæ of *S. ceanothi* and *S. Gloveri* are also nearly alike, the principal difference between these two species and *S. Cecropia* being that their dorsal tubercles are of a uniform colour, orange-red or yellow, while on *Cecropia* the first four dorsal tubercles are red and the rest yellow. The tubercles on the sides are blue on these three species, which are very closely allied. From my notes I take the following on *Samia Gloveri*:—1st stage, larvæ quite black; 2nd stage, larvæ orange with black spines; 3rd stage, dorsal spines orange-red, spines on the sides blue; 4th stage, dorsal spines orange or yellow, spines on the sides blue, body light blue on the back and greenish yellow on the sides, head green, legs yellow; 5th and 6th stages, larvæ nearly the same, tubercles on the back yellow, the first four having a black ring at the base, side tubercles ivory-white with a dark blue base. The larvæ of hybrid *Gloveri-Cecropia* were, as far as I could observe, like those of *Cecropia*, but some had six red tubercles on the back, instead of four as *Cecropia*.

For the first time I became acquainted with the larva of *Attacus Roylei*, the Himalayan oak-silkworm, but only obtained two pairings from about sixty cocoons; this species I found most difficult to pair in captivity. The few larvæ I had of this species did not go beyond the fourth stage, owing to the bad weather; but it has been successfully reared on the continent of Europe. From a letter just received from a correspondent in Vienna, I hear that with twenty-five eggs he obtained twenty-three larvæ, which all lived, and produced twenty-three large cocoons. The same correspondent, with thirty-five eggs of *Samia Gloveri*, obtained twenty cocoons; the larvæ were reared on a species of willow, very likely a form of *Salix caprea*, with narrow leaves, white on the under side. The weather in Vienna was very fine and warm up to the end of August; then not so hot, but still fine.

Another species, which I produced this year, is a new hybrid obtained by the crossing of *Roylei* (female) with *Pernyi* (male). I obtained six such pairings, of long duration, and the eggs were all fertile. The rearing this hybrid has been successful not only in Europe, but also in the U. S. of North America. The cocoon of this hybrid is much richer in silk than that of *Roylei*, and the larva seems stronger and easier to rear than *Roylei*. The cocoon of *Roylei*, thin and poor in silk, although it is of fine texture, is surrounded by a large tough envelope; the greater part of the silk is wasted in the formation of this hard envelope, which cannot, I think, be of any use. On the contrary, the envelope covering the true cocoon of the hybrid *Roylei-Pernyi* is very small, and leaves no space between the envelope and true cocoon; it is almost like that produced by *Pernyi*. I therefore consider the creation of this new hybrid a valuable acquisition to sericiculture, if a sufficient quantity of cocoons has been secured, so as to continue the propagation of the species. The larvæ of my new hybrid are almost similar to those of *Pernyi*. Further information will be given on the rearing of *Roylei-Pernyi* in my next report, when I shall have been supplied with full particulars.

Leaving the silk-producers, I shall say a few words on two American Bombyces reared for the first time in England, and these under glass in the house,—*Orgyia leucostigma* and *Ceratocampa imperialis*.

Orgyia leucostigma.—Eggs of this species, which were unknown when found by my correspondent, were sent to me from Madison, Wisconsin, and I received them on December 29th, 1880. They hatched on May 27th, 1881; the larvæ, which refused to eat the species of maple I offered them, were most successfully reared on oak. The larvæ of this species, which are very beautiful, were exhibited with other larvæ at one of the meetings of entomologists at the Westminster Aquarium. I obtained pupæ, moths, pairings and eggs. The moth is about the same size as that of *O. antiqua*.

Ceratocampa (*Eacles*) *imperialis.*—With twenty-four pupæ of this species I obtained nineteen moths from the 21st of June to the 19th of July, and two pairings; five pupæ died. The pupæ are large, and armed with sharp points at all the segments. The moths are from four to six inches in expanse of wings, of a bright yellow, with large patches, and round spots of reddish brown with a purple gloss; besides these patches and round spots, the wings are covered with small dark dots. The male moth is much more blotched with brown than the female, and, although of a smaller size, more showy than the female. The two pairings took place, the first from the evening of the 13th till the morning of the 14th, the second from the evening of the 15th till the morning of the 16th of July. The ova commenced to hatch on the 31st of July. Eggs large, about the size of those of *Yama-Mai*, *Pernyi*, or *Mylitta*, rather flat, and concave on one side; they are of an amber-yellow colour, and transparent, like those of Sphingidæ.

When the larvæ have absorbed the yellow liquid in the egg, and are fully developed, they can be seen through the shell of the egg, which is white or colourless, when the larva has come out. The larvæ of *Imperialis* have six stages, and the dates of the stages of those I reared here are as follows:—First stage commenced on July 31st; second, August 7th; third, August 17th; fourth, August 29th; fifth, September 18th; and sixth, October 1st. Larvæ went into ground to pupate on October 13th and 14th.

The larvæ of this curious species vary considerably in colour; some are of a yellowish colour, others light brown or tawny, others black or nearly black. In all the stages the larvæ have five spines or horns: two on the 3rd segment, two on the 4th, and one on the last segment but one; this is taking the head as the 1st segment, with regard to the first four spines. These spines are covered with sharp points all round, and their extremities are fork-like. In the first three stages they are horny; in the last three stages these spines are fleshy, and much shorter in proportion than they are in the first three stages. The colour of the spines in the last stages is coral-red, yellowish, or black. In the fifth and sixth stages the spine on the last segment but one is very short. A further description of the larvæ of *Imperialis* in all its stages will be given in my next report. They were reared in the house, under glass, and with the greatest success, till they went into the ground to turn into pupa state.

As soon as my *Imperialis* had hatched I gave them various kinds of foliage, plane-tree, oak, pine, sallow, &c. At first they did not touch any kind of foliage, and I was afraid I should be unable to rear them; but on the second or third day of their existence they made up their minds and decided upon eating the foliage of some of the European trees I had offered them. They attacked oak, sallow, and pine, but did not touch the plane-tree leaves. In America this species feeds on button-wood, which is the American plane-tree (*Platanus occidentalis*), yet the larvæ did not seem to take to *Platanus orientalis*. After a little time I reduced the foliage to oak and sallow branches, and ultimately gave them the *Salix caprea* only, on which they thrived very well. I was pleased with this success, as I had previously read in a volume of the Naturalist's Library a description of *Ceratocampa imperialis*, which ends as follows:—"The caterpillars are not common, and are the most difficult to bring to perfection in confinement, as they will not eat in that situation; and even if they change into a chrysalis, they die afterwards."

Before I finish with *C. imperialis*, I must mention a peculiar fact. During the first stage, and I think also during the second, several larvæ disappeared without leaving any traces. I also saw two smaller larvæ held tight by the hind claspers of two larger ones. The larvæ thus held and pressed were perfectly dead when I observed them, and I removed them. My impression then was that these larvæ were carnivorous, not from this last fact alone, as I had previously observed it with larvæ of *Catocalæ* when they are too crowded, but from the fact that some had disappeared entirely from the glass under which they were confined. I began to reduce their numbers, and put six only under each glass, so as to be able to watch them better. Whether I had made a mistake or not, previously to this, I do not exactly know; but from this moment the larvæ behaved in a most exemplary manner, especially when they became larger. They crawled over each other's backs without showing the least sign of spite or animosity, even when they were in sleep, in which case larvæ are generally very sensitive and irritable; all were of a most pacific nature. It is therefore with the greatest pleasure that, for want of sufficient evidence, I withdraw this serious charge of cannibalism which I first intended to bring against them.

Before I conclude this hastily-written article, I shall say a few words on the difficulty of obtaining fertile eggs of Lepidoptera, especially exotic species. I succeeded, as I had done before, in obtaining fertile eggs of *Deilephila elpenor* and *D. euphorbiæ*, but I had a large quantity of pupæ of these two species. With the American species of Sphingidæ, such as *Sphinx quinquemaculata*, *Ceratomia quadricornis*, and *Daremma undulosa*, it was a complete failure, although I sacrificed all the moths, excepting a few. It was the same with the European species, *Smerinthus quercus*. These failures are due to the number of pupæ being insufficient, and also to other causes. The following statements on silk-producing Bombyces will give an idea of some of the difficulties found in the way when trying to reproduce exotic species in captivity, and the losses incurred with these experiments:—

Attacus Roylei.—Sixty cocoons. Moths emerged from March 5th to June 25th. One pairing, which I forgot to mention, took place on March 6th; the eggs did not hatch, the temperature being too low when the pairing took place. Two other pairings only took place, June 3rd and June 6th; but, as I have mentioned above, six female *Roylei* paired with six male *Pernyi*.

Attacus Atlas (Himalaya race).—Eighty cocoons. Eight moths only emerged from July 31st to September 30th. The cocoons left are in perfect condition, and they will keep till next summer.

Actias Selene.—Sixty cocoons. Moths began to emerge on March 12th, and continued to emerge till August 13th; five months to obtain the moths from all the cocoons. Only one pairing was obtained; it took place on June 30th.

Samia Gloveri.—With about one hundred cocoons. Moths emerged from May 15th till the end of June. Five pairings only.

Telea Polyphemus.—With about sixty cocoons, only three pairings were obtained.

As I have stated, the final or practical result from the larvæ of silk-producing Bombyces reared this season in my garden here has been most unsatisfactory, owing to the bad weather in August; but larvæ of all the species reared have been preserved, and specimens of them in various stages will be seen in the Bethnal Green Museum.

110, Clapham Road, London, S.W.

ON THE SUPPOSED EXTINCTION OF *VANESSA C-ALBUM.*

By E. S. Hutchinson.

"*Vanessa C-album* is undoubtedly becoming scarcer in Great Britain, and is perhaps on the road to utter extinction." The above is a quotation from a notice in the September number of the 'Entomologist' (Entom. xiv. 210), from the pen of Mr. G. Coverdale; and as it winds up with a wish to learn if *V. C-album* is "less common on the Continent or elsewhere," I hope he may pardon a reply from Herefordshire, which is its great stronghold in this kingdom, although it must differ widely from the views he entertains. I am an old entomologist, and have lived in this county and noted the habits of *V. C-album* for fifty years; and I can safely say I never remember the species so common in any autumn as the present one, except in the year 1875, when every blackberry bush was covered with specimens of this lovely and distinct species until late into the autumn. There is a habit here in hop-grounds of collecting all the bine after the gathering is over and burning it, and thus all the larvæ and pupæ which have not been destroyed, when the poles are torn down and the hops gathered, perish in the fire, excepting those which have emerged and thus escape destruction. For many years I have bribed those over whom I have a control in this parish to collect for me every larva and pupa they can find, and by this means I have preserved many thousands of this lovely butterfly; hundreds I have sent as larvæ and pupæ to be let loose in Surrey and elsewhere, hoping to introduce the species, but without success; and hundreds have gone to gladden other naturalists in their collections.

This year I have had about one thousand larvæ and pupæ brought me from the few hop-grounds in our parish; and I learn that around Tenbury, where hop-grounds are far more plentiful than here, the species swarms, and it has been sad to see the destruction of larvæ and pupæ. So far on the "extinction" of this butterfly.

I would further wish to utter a protest against confusing three lovely and most distinct species, and striving to teach that they spring from one common stock. In all courtesy I would ask Mr. Coverdale if he is familiar with the larva and pupa of *V. C-album*, and how widely they differ from those of *V. polychloros* and *V. urticæ*? The habit of *C-album* is to lay its eggs singly. I never saw two larvæ feeding on the same leaf, rarely on the same stem. In the spring currant and nettle is the favourite food, in the autumn exclusively hop, so far as my experience goes, always lying exposed on the under side of its leaf. *Vanessa polychloros* and *V. urticæ*, on the contrary, deposit their eggs in masses, and the young larvæ live, as is well known, in webs, and are strictly gregarious, the former on a bough of wych elm (some twenty or thirty feet from the ground), every leaf of which they consume; the latter on nettle, a bed of which is eaten up by one brood. How can anyone seriously propose that these three spring from one stock?

The larva of *Vanessa C-album* is a wonderfully beautiful one, and might well lead to its being placed—as by Mr. Stainton—in a different genus, so greatly does it differ from any other species of British *Vanessidæ;* the pupa also is far more angulated and beautiful. As to the "indentations of the contour of the wings" interfering with the comfort and well-being of the butterfly, I think anyone who watched, as I did to-day, a number sporting gracefully over a blackberry bush in the warm sunshine would change their opinion.

Vanessa C-album, *V. polychloros* and *V. urticæ* have been handed down to us by our forefathers as three distinct species, and as such, I doubt not, they will be regarded by future generations when the present vague theories have sunk into oblivion.

I will only add that should Mr. Coverdale, or any other gentleman, desire specimens of *V. C-album*, I will gladly forward them, so long as those last which I have set; and next year, if possible, I would send him, or others, larvæ, if they desire to rear the species; but I must warn all that the wonderful abundance of 1875 was followed by a nearly total absence of the species in 1876 and 1877, during which years I did not at any season obtain a single egg, larva or pupa, and one imago only.

Grantsfield, Leominster, October 5, 1881.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

COLIAS EDUSA AT EASTBOURNE.—At the suggestion of Mr. W. H. Harwood, in last month's 'Entomologist' (Entom. xiv. 232), I would record the capture of a male *Colias Edusa* by my sister, on August 28th; and on my way to Beachy Head, September 11th, I took a very fine female. We have seen four others at different times during the season.—R. M. SOTHEBY; Rozel, Eastbourne, October 18, 1881.

PROBABLE EXTERMINATION OF HESPERIA ACTÆON AT LULWORTH.—Having for a good many years been in the habit of visiting Lulworth, the head-quarters of *H. Actæon*, I have noticed that this lively little skipper, so prized by collectors, has been becoming scarcer every year. Formerly, in consequence of the inaccessible nature of the place, Lulworth was visited only by the real lover of Nature or the ardent collector; but now steamers from most of the towns on the South Coast carry thousands of visitors thither, and *H. Actæon* has not a day's respite from the ceaseless inroads made upon its limited domains by the entomologically-inclined portion of these "trippers." Can nothing be done to avert the complete extermination of *H. Actæon* at its old head-quarters? If these collectors (many of whom are only indiscriminate destroyers) could be induced to retain only the bright fresh specimens, and give all the faded worn specimens their liberty again, the chances are that "Lulworth Skippers" would not become an anachronism.—W. M'RAE; Westbourne House, Bournemouth, September, 1881.

HERMAPHRODITE-HYBRID SPHINGIDÆ. — Hermaphrodites of *Smerinthus populi* are far from uncommon, and two were recently exhibited at one of the meetings of the Entomological Society of London; but I was much surprised to read Mr. Briggs's remark in the October number of the 'Entomologist,' that a specimen of the hybrid between *Smerinthus ocellatus* and *populi*, which he had purchased from Mr. Birchall's collection, "was the only hermaphrodite-hybrid *ocellatus-populi* that he was aware of." I was under the impression that hermaphroditism was the usual character of these hybrids; and it has suggested itself to my mind as a possibility, which I have not at present sufficient data either to prove or to disprove, that the sterility of hybrids in general (still a somewhat obscure subject) may perhaps be partly due to hybridism having a tendency to produce hermaphroditism. In vol. iii. (part 3, 1842) of the first series of the 'Transactions of the Entomological Society' (p. 194), Mr. House writes, respecting the *Smerinthus* hybrids in question, "Nineteen caterpillars I reared to perfection, and in August last twelve of the moths came out perfect. . . . The power of reproduction is completely lost, as they appear to be as near intermediate between the sexes as between the species; they evidently partake of the nature of both sexes; as proof, every [newly emerged] insect of the genus *Smerinthus*, on touching, discharges copiously a fluid, which in the male is pure white, in the female of a yellow or ochre-colour. This insect discharged, at the same motion, first the white, and then the ochre fluid quite distinct; and this compound discharge was quite uniform in every specimen, which is never the case in any true species or sex." On p. 195 of the work quoted, Prof. Westwood states that two of these specimens submitted to his inspection were males, so far as related to their external characters; and adds (p. 202), that in all the hermaphrodite *S. populi* recorded up to that time, the right side was male, and the left female. Mr. J. Adamson, of Hulme, writing about a similar brood of hybrids ('Entomologist's Weekly Intelligencer,' vol. iv. p. 127), also states that in his specimens "in general the sexes are more or less mixed. I had one such a decided male, I was almost inclined to see if it would breed."—W. F. KIRBY; British Museum, October 3, 1881.

SPHINX CONVOLVULI IN JULY.—I captured a male specimen of *Sphinx convolvuli* in good condition on July 20th, an unusually early date for its appearance.—J. A. COOPER; 32, Bingfield Street, London, N., October 11, 1881.

SPHINX CONVOLVULI AT ASHBOURNE.—I am glad to be able to record the occurrence of this rare hawk-moth in this town. It was taken at rest on a door-post on September 10th, and is now in my possession.—T. H. HALL; Ashbourne.

SPHINX CONVOLVULI IN NORFOLK.—On September 16th Mr. Howard, of Tottington, brought me a magnificent specimen of *Sphinx convolvuli* in perfect condition. The insect is now in my collection.—R. A. SLIPPER; The Vicarage, Tottington, Norfolk.

SPHINX CONVOLVULI IN LANCASHIRE.—A specimen of this moth, measuring four inches and a half across the wings, was recently captured near here, at rest, by Daniel Marcroft. It is many years since the species occurred in this neighbourhood.—JOHN THORP; Middleton, near Manchester, October 15, 1881.

SPHINX CONVOLVULI NEAR MALVERN.—About the end of August or beginning of September a fine specimen of *Sphinx convolvuli* was captured at Great Malvern, and brought to me alive. I heard of another being captured, at Malvern, also.—H. W. LAW; 24, Queen's Gate Terrace, London, S.W.

SPHINX CONVOLVULI NEAR LEEDS.—On September 7th a fine female *Sphinx convolvuli* was brought to me alive and in good condition. It was taken at rest on a wall opposite the school in Canal Street, Leeds. Another was given to me which was taken on September 27th in a garden at Burley, near Leeds, flying at dusk over a bed of flowers.—CHAS. SMETHURST; 25, Chatham Street, West Street, Leeds.

SPHINX PINASTRI IN HEREFORDSHIRE.—It will perhaps interest some of your readers to hear that I have caught a specimen of *Sphinx pinastri.* The insect was taken in Herefordshire last month.—C. BATTISCOMBE; Hermitage, Bath, October 12, 1881.

CHŒROCAMPA CELERIO IN SLIGO.—I have much pleasure in recording the capture of a specimen of this rare hawk-moth at Mullaghmore, Co. Sligo, Ireland, on September 17th last. It came to light, and was delicately captured by my sister-in-law, the Hon. Mrs. R. J. Greene, and placed under a tumbler. So far so good. But Mullaghmore is not a fashionable watering-place, and entomological appliances are a conspicuous item in its list of desiderata. The first question was, How to kill it? A family council was held: chloric-acid and laudanum were exhibited; subsequently chloroform, which had to be sent for some fifteen miles off, was applied, and afterwards several severe pinches beneath the thorax were administered by my son, who was present. Ultimately the insect succumbed to these powerful appliances; and forthwith arose question No. 2, How to set it? Everything from an entomological view was wanting. However my son, who is no mean proficient in the "craft," manufactured an ingenious structure out of a huge cork-float belonging to a fisherman's net, in the following manner:—The sides were sloped down, and on each was placed a portion of Cadbury's chocolate box, insecurely attached by tin-tacks, and in the groove thus formed *Celerio* was deposited and set. As no one knew what the moth was, a description (very meagre by the way) was sent to me, and from it I gathered that it might be this rare insect. Upon my son's return home, a fortnight or so later, the first thing exhibited was the moth. On opening the box I beheld, with a feeling somewhat akin to rapture, the finest *Chœrocampa celerio* I had ever seen, both as regards size and beauty. There was not the slightest trace of being "rubbed"; the ciliæ even were quite perfect; and the insect itself was set in faultless style. Considering the above-named and other difficulties, the result may be fairly termed "a great performance." So far as I am aware this is the first recorded instance of the capture of *Chœrocampa celerio* in Ireland. It was not contained in my own "List of Irish Lepidoptera," drawn up in 1854, and published in vol. i. of the 'Natural History Review;' nor does it appear in the lists subsequently compiled by my friend, Mr. E. Birchall.—[Rev.] J. GREENE; Clifton, Bristol, October 6, 1881.

Ennomos autumnaria near Dover.—On September 30th I had the pleasure of taking two specimens of *Ennomos autumnaria*, one sitting on a door-step, and one on a lamp-post. On October 2nd I took two more on lamp-posts. Although I have worked very hard since, I have not taken any more, the cold weather which has occurred having no doubt stopped their emergence. —W. Davis; 27, Winchelsea Street, Folkestone Road, Dover, October 13, 1881.

Ennomos autumnaria at Herne Bay.—It may interest your entomological readers to know that on the 2nd of this month I took a specimen of this scarce insect, drying its wings on a poplar tree at Herne Bay.—S. M'Caul; Blackheath Club, Bennett Park, Blackheath, S.E, October 10, 1881. (From the 'Field.')

Ennomos autumnaria (alniaria) near Deal.—I have great pleasure in recording the capture of this great rarity near here, having taken several specimens extending over a number of years. I thought it was only *E. angularia*, and placed it in my collection as such, having never seen the latter species. I have given away my spare ones to young beginners as *E. angularia*, so that they never come under the notice of any elder student of Entomology. The first time Mr. Tugwell called on me and looked over my collection he pointed out one, a conspicuous female, as *Ennomos alniaria*; the others were allowed to stand as *E. angularia*. That gentleman also saw larvæ feeding, and failed to recognise them; but as soon as the eggs hatched that I sent him I was informed by a stranger that they were *E. alniaria*. Once in possession of their true character, I soon determined to find them out; and, having found a stray one, I commenced to scour the country round here, but could only find an occasional specimen, until returning from a long and fruitless walk I suddenly found myself in the midst of their settlement. Then I went to work with a will, and soon was in possession of twenty-three specimens of the genus, seventeen being *E. alniaria* and six *E. tiliaria*. Though I visited the same place many times afterwards, I can only count up twenty-eight specimens all told. As I understand that a lot of foreigners are introduced as British, I hope entomologists will see a series I intend to send to a friend, to be exhibited at the first Monday of the month's meeting at the Aquarium, when all doubts as to the species being British will be removed. I have eggs which I hope to breed in the spring, but for the present I have no eggs to spare for enquiring friends. —R. HARBOUR; 1, Landport Cottages, Deal, Kent, Oct. 22, 1881.

ENNOMOS AUTUMNARIA.—On September 28th I took two fine specimens of this rare moth, both from street lamps; one at 6.30 a.m., the other at 9 p.m.—M. RICKETTS; Bouverie House, Folkestone, October, 1881.

ENNOMOS AUTUMNARIA AT FOLKESTONE.—On September 29th, in the evening, I had the good fortune to take a fine specimen of *E. autumnaria* (*alniaria*) from a lamp in the outskirts of the town. The specimen is a male, and in very fine condition. —W. BLACKALL; 9, Church Street, Folkestone, October, 1881.

ENNOMOS AUTUMNARIA.—I am informed by Mr. A. Wailly that both this and last season he sent out to correspondents in many parts of this country a very large number of foreign eggs of this species. As he fears he may have been the accidental cause of specimens of foreign origin being introduced into this country, he wishes me to make this announcement, especially as he has heard of larvæ from such eggs being sold at one shilling each.—JOHN T. CARRINGTON; October, 1881.

ABRAXAS ULMATA DOUBLE-BROODED.—Could you or any of the readers of the 'Entomologist' inform me if *A. ulmata* is double-brooded, as last August I took some of its larvæ at Malvern, and they underwent pupation last month? I noticed that the pupæ were unusually small, only about half the usual size. I was rather surprised at the beginning of this month to find one had emerged; like the chrysalis, it was a dwarf. I have had none emerge since. — ALFRED T. MITCHELL; 3, Clayton Terrace, Gunnersbury, October 22, 1881.

EMMELESIA TÆNIATA LARVÆ.—In the first week in August a female *E. tæniata* laid about a dozen eggs. The young larvæ put in an appearance in the third week afterwards; they are now half grown, and seem inclined to hybernate. The only pabulum they seem to take to is the lower leaves, when withering, of a flowering moss (*Bryum*). I have put one into a box along with some of the plant, which is now in flower, and it has eaten some of the flowers to go on with; but my impression is that this larva feeds on the seeds in spring.—J. B. HODGKINSON; Spring Bank, Preston, October 10, 1881.

Eupithecia absynthiata feeding on Tansy.—On October 15th I found about twenty larvæ feeding on the blossoms of the tansy, which Mr. G. Baker, of this town, pronounces to be those of *Eupithecia absynthiata*. They are of three different colours,—pink, green, and yellow; the first variety being by far the most numerous, but all are identical in markings. I believe this is a new food-plant for the species; in fact I am not aware that it has been recorded as the food of any Macro-lepidopterous insect.—[Rev.] Chas. F. Thornewill; The Soho, Burton-on-Trent.

Notes on Platypteryx sicula.—I have great pleasure in recording my success in breeding *P. sicula*. In the autumn of last year, after a most diligent search, I succeeded in finding a few larvæ; these turned to pupæ during October. The first specimen, a male, emerged May 18th. I much regret I was unable to obtain fertile eggs. Two pairs were *in copulâ* over twenty hours, but the eggs deposited proved infertile. I have spent a good deal of time this season searching for this moth, but only captured one specimen. As I have done rather better in collecting the larvæ this autumn, I trust I may be successful and obtain fertile eggs.—W. K. Mann; Clifton, Bristol.

Hecatera dysodea in Northumberland.—We understand that the two so-called *H. dysodea*, which were caught at Heaton Hall, Northumberland, in September last, proved to be a case of mistaken identity. The two moths taken at light were the local variety of *Polia chi*, with wings of delicate olive-green interrupted by four transverse series of pure white spots. Five in all have been captured.—Ed.

Aplecta occulta at Ely.—I think perhaps it may interest some of your readers to know that *Aplecta occulta* has been taken by me in Ely, at sugar, on September 3rd, 5th and 13th, one on each evening, and in good condition. Mr. Newman says "On the wing in July," and does not record it as being taken in Cambridgeshire. In July last I took *Coremia quadrifasciaria* at Cromer, Norfolk; also at Stanstead, Essex.—W. J. Cross; Ely.

Aplecta occulta near Wimbledon.—While collecting in August last, near Wimbledon, I took a specimen of the above insect on a fence. Is not this rather uncommon so near London?—A. Sinclair; Fulham, September 26, 1881.

PLUSIIDÆ IN COUNTY SLIGO.—*Plusia bractea.* Sweet-william blossoms appear to be very attractive to this species, as well as others of the *Plusiidæ*. During July last I succeeded in taking fifteen specimens, mostly in excellent condition. The other members of the family occurring here and taken in the same way were *Abrostola urticæ* and *A. triplasia*, *Plusia chrysitis*, *P. iota*, and *P. gamma*, the scarcest being *Plusia gamma.* I have prepared a good bed of sweet-williams for next year, hoping to be able to attract a sufficient number of *Plusia bractea* to distribute to any applicants. Will anyone kindly give me a hint about the larvæ? I have searched hemp agrimony in vain; in fact the reputed food-plant is decidedly scarce here, occurring only in one place, and that to a limited extent.—PERCY H. RUSS; Culleenamore, Sligo, October 10, 1881.

[In a late volume of this Journal Mr. J. B. Hodgkinson wrote, "When looking for larvæ of *Gelechia tricolorella* on the stitchwort (*Stellaria holostea*), I found a large larva of a *Plusia*, which I hope to be *P. bractea.* I used to take it frequently here some thirty years ago; it was feeding upon dog-mercury" (Entom. xii. 182). Mr. George Norman wrote, "My friend N. F. Dobrée took *P. bractea* over flowers of *Centaurea nigra.* The larvæ probably feed on *Ononis arvensis*, which grows in profusion close by" (Ent. Mo. Mag. viii. 211). Following the continental authors, Mr. Kirby writes, "The larva resembles that of *P. iota*, and feeds on hawkweed and dandelion in May and June." Compare Stett. Ent. Zeit. xx., p. 380.—E. A. F.]

UNCOMMON LEPIDOPTERA NEAR NEWCASTLE.—On September 13th Mr. Henderson, of this town, took a fine specimen of *Aplecta occulta* at rest on a stone wall in Jesmond Road, near here; and on the 15th he also captured a good specimen of *Cloantha solidaginis* in the same locality; the latter I believe is quite new to the district, and the other very uncommon. In the beginning of June, Mr. T. H. Hedworth, of Dunston, met with *Lobophora viretata* in considerable quantities at rest on the trunks of beech-trees.—W. MALING; Ellesmere Villa, Granville Road, Newcastle-on-Tyne, October 12, 1881.

PÆDISCA SORDIDANA AND P. OPTHALMICANA..—I have again taken *P. sordidana.* I took a nice series by beating alder bushes in this neighbourhood, on September 26th. At the same time I got a few nice *P. opthalmicana* from poplar.—W. PREST; 13, Holgate Road, York, October 16, 1881.

DESCRIPTION OF THE LARVA OF PTEROPHORUS TEPHRADACTYLUS.—In May last year, and again in May of this year, Mr. W. H. Grigg, of Bristol, kindly sent me larvæ of this species feeding on the leaves of golden-rod. Length about half an inch, and of the usual shape characteristic of the genus; rather flattened ventrally, but roofed upwards from the spiracular region to the dorsal area, which is also rather flattened; head polished, about the same width as the second, but narrower than the third, segment; segmental divisions clearly defined; tubercles prominent, each of them emitting several short hairs. Ground colour grass-green, the head pale yellow; there is an interrupted grey line along each side of the dorsal ridge, and a faint indication of a similarly coloured subdorsal line; tubercles greyish white, as are also the hairs; the segmental divisions yellowish. Ventral surface uniformly grass-green. The pupa is attached by the anal segment to a stem or leaf of the food-plant, and although there is no silken belt its position is not suspended, but flat along the stalk or leaf to which it may be attached. It is barely half an inch long, compact, and of moderate bulk; there is a distinct depression extending through the centre of the dorsal surface from the head to the anal segment; and the abdominal divisions, eye- and leg-cases are well defined. Ground colour dingy dull green; the sides thickly prickled with smoke-colour; there is also a smoky stripe through the wing-cases; the hairs grey. The imagos emerged early in June.—G. T. PORRITT; Highroyd House, Huddersfield.

DOES FOOD PRODUCE VARIATION?—From recent experience I should be inclined to answer this question in the affirmative. Whilst larva-beating on Saturday last, I obtained what I believe to be a variety of the larva of *Smerinthus populi*; it has all the markings of this insect, and, in addition, a double row of ten reddish spots on each side, agreeing exactly with the larva described by Rev. W. W. Flemyng in the 'Entomologist,' October, 1880. This insect I found feeding on willow, and although I have placed poplar in the cage it prefers the former for its food. Whether I shall obtain a variety of the imago remains to be seen. —N. C. GRAHAM: Silwood, Tulse Hill, October 6, 1881.

DOES FOOD PRODUCE VARIATION?—Under this title I notice some remarks at p. 234 of this Magazine. Without commenting on that article, I may state for the guidance of others that I am always most successful in rearing varieties when I feed the species all through, while in the larval stage, with the *same* kind of food.—C. SMETHURST; 25, Chatham Street, Leeds.

INSECTS AND THEIR FOOD-PLANTS.—About two years ago I drew attention in the pages of the 'Entomologist' to the wonderful instinct possessed by insects in discovering plants to feed upon not indigenous or common in cultivation, but which have an affinity to those native plants on which their larvæ are generally met with, instancing the *Buddlea globosa*, an American shrub of ornamental character, with the little weevil *Cionus schropulariæ.* I now again find the same shrub this season almost denuded of its leaves by a schropulariaceous feeder of another order, namely, the larva of the common mullein moth, *Cucullia verbasci*, in a friend's garden at Croydon. Fortunately for him the larvæ, being of a very conspicuous and showy character and in considerable numbers (more than would fill a pint measure), were detected by his boys before too much mischief had been done; and as a consequence the young collectors of the neighbourhood were only too anxious to transfer to their breeding-cages what would have been a nuisance and an eyesore had they not been discovered in time.—V. R. PERKINS; 20, Gloucester Street, S.W., August 20, 1881.

ENTOMOLOGICAL NOTES FROM BOURNEMOUTH. — About the beginning of July last a fine specimen of *Deiopeia pulchella* was caught by a lady in a garden in this town. I have also to record the capture of several specimens of *Sphinx convolvuli* during the early part of September; three were brought to me alive and in fine condition, and I was informed that others were captured in various parts of the town; but while congratulating ourselves on the addition of one or two "good things" to our cabinets, we have to deplore the general scarcity of our usual autumn species. Sugaring here during the last ten weeks has been an entire failure; an occasional earwig or spider regaling itself in solitary luxuriance on our sweets is about the only living thing that greets the expectant eye of the collector. Even the bold *Xylophasia polyodon* and persistently intrusive *Phlogophora meticulosa* are "conspicuously absent." The usually abundant and ubiquitous

Plusia gamma has scarcely put in an appearance at all; I believe I have seen only two during the whole season. Over the New Forest, where extensive defoliation prevailed about midsummer, doubtless causing the starvation of myriads of newly-emerged larvæ, we might reasonably have anticipated a dearth of autumn species; but here no such denudation existed: it is therefore difficult to assign any cause for the general scarcity of our common species. It would be interesting to know the experience of other collectors in other parts of the country.—W. M'RAE; Westbourne House, Bournemouth, September 21, 1881.

LASIUS MIXTUS, *Nyl.*: AN ANT NEW TO BRITAIN.—On the 2nd September last, at Bickleigh, about eight miles from Plymouth, I had the pleasure of seeing a family of ants on an old bramble stem. They were evidently enjoying themselves in the bright sunshine, but their enjoyment was of short duration after I had "spotted" them, for I at once prepared to box a few, which I did by holding my box under and giving the stem a gentle tap. I secured about a dozen, consisting of males and females. Below them on the ground were the workers in great commotion; of these I obtained a few. At the time of capture I took them to be *Lasius umbratus*. After reading Mr. Smith's description I discovered my error. I visited the locality again on the 6th and several times since without seeing a single worker. They must be very retiring in their habits; and my only chance of renewing my acquaintance with them will be at their next family gathering, when I hope to have the pleasure of being "an uninvited guest." In order to ascertain what my captures were I sent specimens to Mr. Saunders, who very kindly informed me that they were *Formica mixta* of Nylander. They are of the race of *L. umbrata*, but differ from it as follows:—In colour the males and workers are very similar; the female, however, is brownish black. The male has the eyes destitute of hairs. The female has the head much smaller, *nearly* as wide as the thorax; the fuscous cloud at the base of the wing is not so dark, but extends *beyond* the discoidal cell, and the discoidal cell is smaller.—G. C. BIGNELL; 7, Clarence Place, Stonehouse, Plymouth, October 12, 1881.

HAGGERSTON ENTOMOLOGICAL SOCIETY.—On Friday, October 21st, this Society held its Annual Exhibition of insects of all orders. The new feature of the year was the temporary migration of the Society from its usual meeting-room, where the exhibitions have hitherto been held, to a school-room in the neighbourhood. Though much larger than the old room, the space allotted to exhibits was fully covered; and at least a thousand persons must have attended during the evening. In regard to the insects of the year exhibited, they did not seem to be quite up to the average either in rarity or variation. Nevertheless, as a whole, it was an interesting and instructive show. Undoubtedly the case which commanded most attention of the initiated was that shown by Mr. Boden; in it was a series of fifty-four varieties of *Peronea hastiana*, a variety of *Toxocampa pastinum*, curious white-spotted variety of *Leucania lithargyria*, beautiful series of *Coremia quadrifasciaria*, varieties of *Venilia maculata*, *Rivula sericealis* (cloudy), *Catoptria hypericana* (with silvery under wings), and curious form of *Coccyx splendidulana;* the southern form of *Peronea Caledoniana*, with Scotch examples for comparison; several *Mixodia Bouchardana* from Kent, and other rarities: all were remarkable for the beauty of condition and perfect setting. Mr. Jobson exhibited long series of *Stauropus fagi*, black form of *Limenitis Sibylla*, and other New Forest species; also some living larvæ of *Limacodes assellus*, showing their mode of hybernation. Mr. Cooper, two varieties of *Argynnis Aglaia*, *Apatura Iris* var. *Iole*, and the hybernated *Vanessa Antiopa* already recorded. Mr. H. Bartlett, many nice and well-set Lepidoptera of the year, including a variety of under side of *Thecla betulæ*. Mr. Meek exhibited a case of the rare Bornean butterfly, *Ornithoptera Brookeana*, which for exceeding brilliancy of colour was unsurpassed. Mr. Southey, a *Deiopeia pulchella* taken in 1880, varieties of *Abraxas grossulariata*, &c. Mr. F. Bartlett, case of the season's Lepidoptera, including fine series of *Cosmia pyralina*. Mr. T. F. Briggs, a pair of *Notodonta carmelita*, &c., taken this season at West Wickham. Mr. Eedle showed a case of life-histories of Lepidoptera preserved with his usual skill; Mr. J. Russell, many preserved larvæ of the same order; and Mr. Blaxton, case of carefully-preserved life-history of *Cossus ligniperda*, showing not only the changes of the insect, but some of those of its parasites. Mr. C. H. Williams also showed well-preserved larvæ, including *Cucullia verbasci* and *C. lychnitis* on a sprig of mullein. Mr. Bryant, a diaphanous form of *Bombyx quercus*, yellow-banded *Sesia culiciformis*, &c. Mr. E. Anderson, interesting collection of Macro- and Micro-Lepidoptera, and water-colour drawings, by himself, of larvæ of the same order on their food-plants. Mr. Huckett, anothe collection; he had also lent many cases of ornithological subject for the decoration of the room. Mr. Chas. M. Allen sent a cas illustrating all orders of insects. Messrs. Vandenburgh, a smal collection of Coleoptera, Neuroptera, &c.; and Mr. Leucock some generic types of Coleoptera, especially wood-borers, and series of species which he had taken from a single dead duck Messrs. Harper, sen., and Mr. Clark made a good exhibition wit portions of their general collections of Lepidoptera, includin many rare species and fine varieties. The visitors included man well-known entomologists, and not a few ladies.—J. T. C.

ENTOMOLOGICAL EVENING, ROYAL AQUARIUM.—Among man other interesting species exhibited at the meeting of October 13t Mr. Wailly showed living larvæ of *Samia Promethea*, *S. cecropia* and *Saturnia* (*Hyperchiria*) *Io*, from North America; also som cocoons, sent from Queensland, which were supposed to be thos of a silk-producing Bombyx. These wonderfully-worked cocoon were produced by a spider; one was opened, and the youn spiders were seen hatching. The nest has the shape of th cocoon of *Attacus Cynthia*, but is longer and wider. The toug papery envelope is whity brown in colour, and is filled with a mas of soft silky cotton-like material, in the centre of which is place the batch of eggs and from which young spiders were see emerging at the time of exhibiting. Mr. Olliff, *Hemerophil abruptaria*, a fine variety, and a rare beetle, *Homalium rugulipenne* Rye, taken in Caithness. Mr. Eedle, *Peronea cristana* vars. Mr Cooke, two fine *Nascia cilialis*. Mr. Meek and Mr. Machin *Geometra smaragdaria*; those exhibited by the former gentlema were reared from larvæ, by Mr. David Pratt, of Mile End; th latter gentleman also exhibited *Ennomos autumnaria* (*alniaria*) Mr. J. A. Clark, four varieties of *Polyommatus Phlæas*, one ver black, the others more or less light-coloured; also a white variet of *Dianthœcia carpophaga*. Mr. C. A. Cooper, fine varieties o *Argynnis aglaia*, and an example of *Sphinx convolvuli* taken i August. Mr. H. Bartlett, *Phycis betulella*, *Tethea retusa*, &c Mr. Tugwell, *Mecyna polygonalis*, *Ennomos autumnaria* (*alniaria* and a fine series of *Nola centonalis* showing much variation o marking; also some living specimens of this species, the pupa cases, and a beautiful drawing of the larva by Mr. Buckler. Abou forty-five gentlemen interested in Entomology attended.—J. T. C

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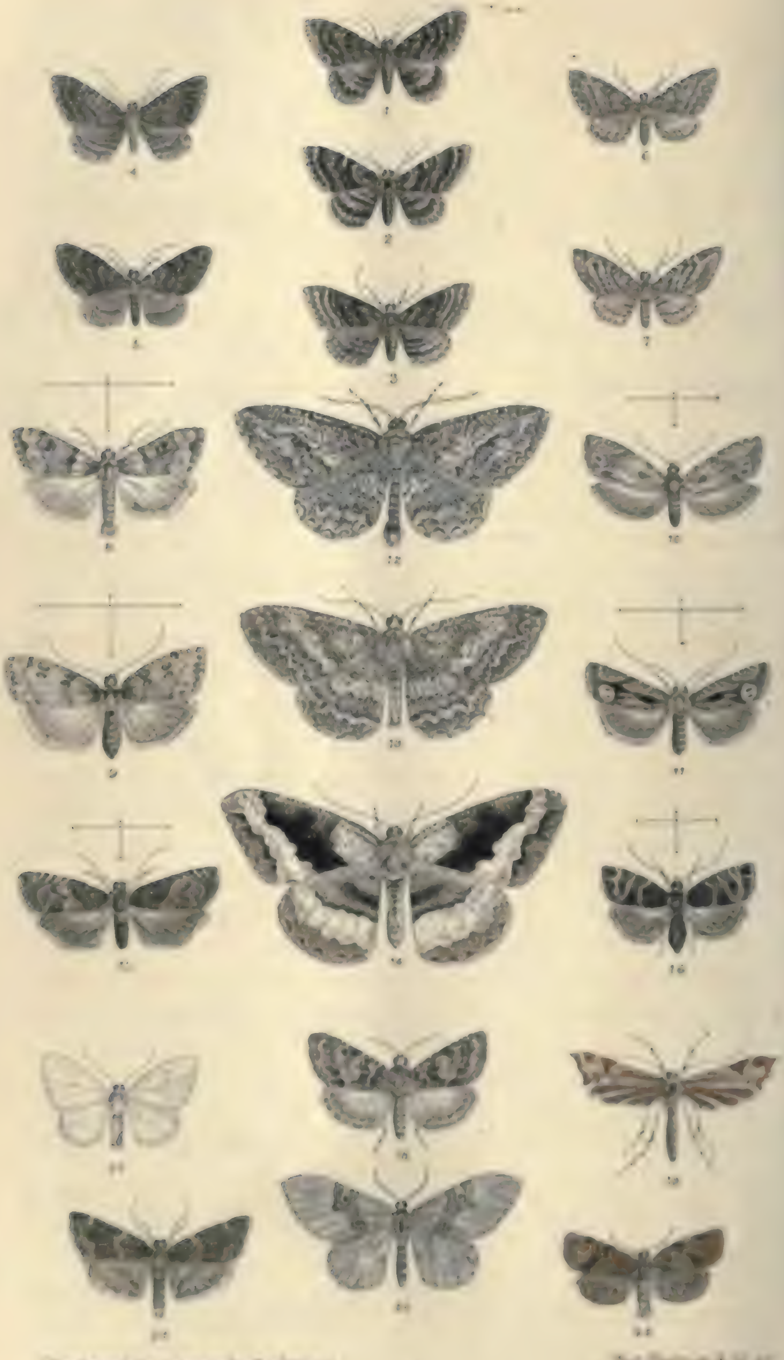

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SOME THOUGHTS ON THE DISTRIBUTION OF THE BRITISH BUTTERFLIES.

By F. Buchanan White, M.D., F.L.S.

Accustomed as we are to the rich vegetation with which most parts of the British Islands are to-day clothed, we are apt to forget sometimes that at no very distant geological period the whole country was totally destitute of all plant-life, and consequently, as a matter of course, uninhabitable by any animals. It is probable, however, that, soon after the present flora came in, the animals which derive their sustenance from it made their appearance, and we may be sure that amongst the earliest would be plant-eating insects, and more especially the Lepidoptera. But it is almost certain (though we have no direct evidence of this) that certain kinds of plants would precede other kinds, and it is therefore likely that the insects would come in like order, and follow the plants on which they fed. If, therefore, we can arrive at some conclusions as to the order in which the plants came, we shall be able to discover one factor in the distribution of the insects. There are, however, other factors whose effect must have been, and still is, very great; and to discover these offers a very interesting problem.

The British Rhopalocera and their present distribution in these islands at the present day may be stated thus:—

Papilio Machaon, L. England (south-east).
Leucophasia Sinapis, L. England and Ireland.
Euchlöe Cardamines, L. England, Scotland, Ireland.
Pieris Daplidice, L. England (south).
P. Napi, L. England, Scotland, Ireland.
P. Rapæ, L. England, Scotland, Ireland.

P. Brassicæ, L. England, Scotland, Ireland.

Aporia Cratægi, L. England.

Colias Hyale, L. England, Ireland.

C. Edusa, F. England, Scotland, Ireland.

Gonepteryx Rhamni, L. England, (Scotland), Ireland (south).

Vanessa Atalanta, L. England, Scotland, Ireland.

V. Antiopa, L. England, Scotland, Ireland.

V. Io, L. England, Scotland, Ireland.

V. Urticæ, L. England, Scotland, Ireland.

V. Polychloros, L. England, Scotland (sporadic).

V. C-album, L. England, Ireland.

V. Cardui, L. England, Scotland, Ireland.

Melitæa Aurinia, Rott. (= *Artemis*, Hb.) England, Scotland, Ireland.

M. Cinxia, L. England (south).

M. Athalia, Esp. England (south), Ireland (south).

Argynnis Selene, W. V. England, Scotland.

A. Euphrosyne, L. England, Scotland.

A. Adippe, L. England (Scotland ?).

A. Aglaia, L. England, Scotland, Ireland.

A. Lathonia, L. England, Ireland (south).

A. Paphia, L. England, Scotland, Ireland.

Limenitis Sibylla, L. England.

Apatura Iris, L. England (south of the Humber).

Hipparchia Semele, L. England, Scotland, Ireland.

Erebia Epiphron, Knoch. England, Scotland, Ireland.

E. Æthiops, Esp. England, Scotland.

Melanargia Galathea, L. England.

Satyrus Megæra, L. England, Scotland, Ireland.

S. Ægeria, L. England, Scotland, Ireland.

Epinephele Hyperanthus, L. England, Scotland, Ireland.

E. Janira, L. England, Scotland, Ireland.

E. Tithonus, L. England, Scotland, Ireland.

Cœnonympha Pamphilus, L. England, Scotland, Ireland.

C. Typhon, Rott. England, Scotland, Ireland.

Nemeobius Lucina, L. England, Scotland (south-west).

Polyommatus Arion, L. England.

P. Semiargus, Rott. England.

P. Minima, Fuess. (= *Alsus*, F.) England, Scotland, Ireland.

P. Argiolus, L. England, Ireland.

P. Corydon, Poda. England.

P. Bellargus, Rott. (= *Adonis*, Hb.) England.

P. Icarus, Rott. England, Scotland, Ireland.

P. Astrarche, Bergstr. (= *Agestis*, Hb.) England, Scotland.

P. Ægon, W. V. England, Scotland, Ireland.

Lycæna Dispar, Haw. England (formerly).

L. Phlæas, L. England, Scotland, Ireland.

Zephyrus Betulæ, L. England, Ireland.

Z. Quercus, L. England, Scotland, Ireland.

Thecla Rubi, L. England, Scotland, Ireland.

T. Pruni, L. England.

T. W-album, Knoch. England.

Hesperia Malvæ, L. (= *Alveolus*, Hb.) England, Scotland, (Ireland ?).

Nisoniades Tages, L. England, Scotland, Ireland.

Cyclopides Palæmon, Pall. (= *Paniscus*, F.) England.

Pamphila Comma, L. England.

P. Sylvanus, Esp. England, Scotland, Ireland.

P. Actæon, Esp. England (south).

P. Thaumas, Hufn. (= *Linea*, F.) England, Ireland.

From this statement it will be seen that all the sixty-four species enumerated above are found in England, but that twenty-eight (not including three of doubtful or sporadic occurrence) do not inhabit Scotland, and twenty-five, or perhaps twenty-six, have not been detected in Ireland.

It remains, therefore, to discover (if we can) the reasons why certain species are absent from Scotland and Ireland, why certain others which inhabit Scotland do not occur in Ireland, and why some of the Irish species are not also Scottish. Having discussed these points we will then pass on to the question of the order in which the various species arrived in Britain.

In trying to find reasons for the absence from, or presence in, a country of any particular species, there are several things which must be first taken into account, as, for example, the accessibility of the country, the presence in it of the food-plant, the climatic conditions, &c.

It seems unnecessary to remark that a species will spread much more easily over a comparatively level land-surface than across a sea, or even over a mountain range. As far, therefore, as mere accessibility is concerned, the butterfly fauna of Scotland ought to be more extensive than that of Ireland, for in the one case there is still a continuous land-surface, in the other a formidable passage across the sea must be encountered. That this was not always the case is now well known; but before entering on the subject we propose discussing, it will be well to give an outline of part of the geological history of the British Islands in post-glacial times.*

Immediately after the Glacial Period (during which great ice-sheets covered the most of North and North-western Europe, including the British Islands) the area of Great Britain and Ireland was much the same as it is now, though South Scandinavia was submerged. At this time the climate was genial, and the plants and animals which had been driven south by the cold began to come north again. After this, or in middle post-glacial times, the land rose, and our islands were joined to continental Europe. This land connection was very extensive, all the sea-bottom which is not now more than one hundred fathoms from the surface being then dry land. This would give us an area reaching from Denmark to Shetland, the Færöes, and probably Iceland, thence passing outside the Hebrides and Ireland, and gradually joining the present French coast-line in the extreme south-west. All this area was not, however, dry land, for it was in places intersected by great rivers and lakes, the most important of the latter being one lying between England and Ireland, and reaching from opposite Wales to beyond the North of Ireland. As I have already pointed out the climate was then genial, and there was an enormous growth of forests.

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* For a fuller account the reader is referred to Dr. James Geikie's 'Great Ice-Age' and 'Pre-Historic Europe;' also 'Scottish Naturalist,' v. 202.

In late post-glacial times Britain became again insulated, the land area being rather less than it is at present. The climate was colder, with a large rainfall, snow-fields and local glaciers, and an abundant growth of peat. During this time some of the southern animals, which had been tempted northwards by the genial climate, were killed or driven away, and the few that remained decreased both in numbers and in size. After this the land was re-elevated to its present position, and the climate gradually became more congenial.

Having thus briefly sketched the condition of the country during the time that most of our butterflies came in, let us try and discover the reasons for the absence at the present day of some of them from Scotland and Ireland. I say at the present day, because I think it is extremely probable that at one period (say in the middle-glacial times) we had more species than we have now. As, however, there is no proof for or against this, we need not take it into consideration at present.

We will begin with the species absent alike from Scotland and Ireland, somewhere about nineteen in number.

In the first place it may be remarked that there is nothing as regards the food-plants of these species which would tend to prevent their occurrence. They all feed on plants which are as common in Scotland and Ireland as in England. The cause, therefore, of their absence must be sought elsewhere.

In the second place the question of latitude (and consequent climate, for there are other factors in the climatic conditions to be taken into account) must be considered. Are Scotland and Ireland too far north for the species in question? To answer this we must consider the species in detail, with the following result. Four of them, namely, *Machaon*,* *Cratægi*, *Semiargus* and

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* For brevity's sake, and as there is no risk of confusion, I drop, in the rest of this paper, the generic names of the species.—F. B. W.

Palæmon, are found beyond or on the arctic circle; while five others occur above or near the 60th parallel of north latitude, namely, *Polychloros* (which has occurred in Scotland, though perhaps it can scarcely be considered a true native), *Cinxia*, *Adippe*, *Arion*, and *Palæmon;* and four more, namely, *Daplidice*, *Bellargus*, *Pruni* and *W-album* have been detected in Scandinavia. We thus have thirteen species which inhabit latitudes north of the British Islands, and which, therefore, so far as that goes, ought to occur in Scotland and Ireland. Of the remaining six species, *Dispar* may be put aside as a species the typical form of which was confined to England, and is now unhappily extinct. For the remaining five—*Sibylla*, *Iris*, *Galathea*, *Corydon* and *Actæon*—the latitude of Scotland and Ireland is rather beyond the range of the species.

Let us now return to the thirteen species which range north of Britain, and find, if possible, a reason for their absence. For most of them the reason is, I think, the *insular* nature of the climate. By an "insular" climate is meant one which by the proximity to the ocean has a greater humidity and less extremes of heat and cold than is the case when the ocean is more distant, or its influences obstructed by intervening high land. That an insular climate affects very considerably the range of plants has now been proved, and it is but natural to suppose that similar influences may affect insects. Of the thirteen English species whose absence from Scotland and Ireland we are now considering, several, if not all, occur in those parts of England which have a more "continental" climate. Of these *Machaon*, *Daplidice*, *Cinxia*,* *Arion*, *Palæmon*, *Comma*, are good examples. But in addition to these climatic reasons there is the unexplained tendency of some species to be local and rare, especially on the confines of the regions that they inhabit, and which must not be altogether lost sight of in discussing geographical distribution.

Let us next consider the species, nine in number, which inhabit Ireland, and are not to be found in Scotland. Of these, six—*Sinapis*, *Rhamni*, *C-album*, *Athalia*, *Lathonia* and *Argiolus*—occur in latitudes north of Scotland (two of them, *Athalia* and *Lathonia* being indeed arctic), two are Scandinavian (*Betulæ* and *Thaumas*), and the remaining one, *Hyale*, has been possibly seen in Scotland, as indeed has *Rhamni*. That some of these occur in South Scotland is not improbable, but the chief interest their apparent absence possesses is from the belief, held by many naturalists, that Ireland derived its fauna from Scotland. If such be the case, and these species were once inhabitants of Scotland, it may have been in the more genial climate of middle post-glacial times, and that they perished in the less genial period which followed. Flourishing as they do in the mild and humid atmosphere of the South-west of Ireland, it seems clear that they are not dependent on a "continental" climate, as we have supposed some of the species absent alike from Scotland and Ireland to be.

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* It must not be supposed that because the Isle of Wight is an island that its climate is thereby "insular."

The distribution of the species which occur in Scotland, but are absent from Ireland, must now be considered. They are five in number; and if it be the case that *Helianthemum vulgare* is the food-plant of *Astrarche* (as it certainly is of its variety *Artaxerxes*), then the absence of that species can be accounted for. I believe, however, that it also feeds on *Erodium cicutarium*, which, unlike the *Helianthemum*, is an Irish plant.

Of the five Scottish species not found in Ireland three (*Selene*, *Euphrosyne* and *Astrarche*) are arctic, one (*Lucina*) occurs in South Sweden, and the remaining one (*Æthiops*), though a species of central Europe, has so wide a distribution in Scotland that its absence from Ireland is very remarkable. So far as can be seen there is no climatic reason by which the absence (if such be really the case) of these species can be explained. We are, therefore, driven to suppose that the land connection with Ireland must have been severed before they were able to establish themselves, and that no friendly wind has since wafted them across the narrow sea, and so implanted them in the Emerald Isle.

In connection with the whole group of the British butterflies there is a question of much interest, but one to which we can scarcely hope to get a satisfactory answer. It is this. In what order relatively did the various species come to Britain? There is also another matter on which the exotic distribution (that is the distribution in other countries than Britain) throws a certain light, and that is the relative antiquity of each species.

We will first briefly discuss the latter question.

It may be taken for granted that, unless circumstances (*e. g.*, human agency, conscious or unconscious), have been exceptionally favourable, species which have the widest distribution are probably of greater antiquity than those whose distribution is less extensive. Species, therefore, which are inhabitants of both the old and new worlds may justly be considered to be of greater antiquity than species which are confined to Europe. It is probable, in fact, that the less wide the distribution, the younger the species, unless we have direct or indirect evidence to show that it is a species which is dying out, and which situated in some happy spot, where the struggle for existence is less intense, leads a peaceful and undisturbed life. Such a spot may be found in some of the oceanic islands, but scarcely in Europe, where only the species best fitted to survive have passed safely through the ups and downs of the eventful Glacial Period.

To begin with the species of restricted distribution.

Facile princeps amongst these would be the now extinct *Lycæna dispar*, which seems to have been confined to England, though its var. *Rutilus* inhabits Central and East Europe and North and West Asia.

Next in order come *Sibylla*, *Epiphron*, *Galathea*, *Typhon*, *Lucina*, and *Corydon*, all of which seem to be confined to Europe proper, and in most cases to Central Europe, none of them except *Typhon* (which is arctic) ranging very far north, though possibly one or two reach Asia Minor.

The next lot occur in Europe and in North and West (or North or West) Asia, and include *Sinapis*, *Cratægi*, *Polychloros*, *Cinxia*, *Adippe*, *Iris*, *Semele*, *Æthiops*, *Megæra*, *Hyperanthus*, *Arion*, *Minima*, *Betulæ*, *Quercus*, *Pruni*, *W-album*, *Tages*, and *Palæmon*.

The thirty-nine species which remain have a wider range.

Of these at least seven—*Machaon*, *Hyale*, *Edusa*, *Lathonia*, *Icarus*, *Astrarche*, and *Phlæas*—reach the Himalaya, and two others, *Brassicæ* and *Argiolus*, have representative forms there. Three at least reach Japan, namely, *Hyale*, *Edusa*, and *Io*.

A rather large number occur on the south side of the Mediterranean, and are recorded from North Africa, viz., *Machaon*, *Daplidice*, *Rapæ*, *Brassicæ*, *Hyale*, *Edusa*, *Rhamni*, *Atalanta*, *Antiopa*, *Aurinia*, *Lathonia*, *Ægeria*, *Janira*, *Pamphilus*, *Argiolus*, *Bellargus*, *Icarus*, *Astrarche*, *Phlæas*, *Rubi*, *Actæon*, and *Thaumas*.

One—*Hyale*—occurs in South Africa, where *Edusa* is represented by the closely allied species *Electra*.

In North America, but chiefly on the western side of that Continent, several species are said to have been found. Of these *Machaon*, *Antiopa*, *Atalanta*, and *Phlæas* seem certainly to occur, while *Hyale*, *Edusa*, *Rhamni*, *Comma*, *Sylvanus*, and *Thaumas* have all been reported, and if they do not actually occur are represented by species very closely allied, as are *C-album*, *Aglaia*, and *Argiolus*. A supposed variety of *Rubi* has been found in California, and *Rapæ* has been introduced into Canada, &c., in late years, and seems already to have developed a climatic race.

Finally, *Cardui* appears to occur nearly all over the world, except in South America.

Of the species mentioned above, twenty-one have been found within or near the arctic circle, namely, *Machaon*, *Cardamines*, *Napi*, *Antiopa*, *Urticæ*, *Athalia*, *Selene*, *Euphrosyne*, *Aglaia*, *Lathonia*, *Tithonus*, *Pamphilus*, *Typhon*, *Semiargus*, *Icarus*, *Astrarche*, *Ægon*, *Phlæas*, *Rubi*, *Malvæ*, and *Comma*.

If we are to judge, therefore, from the wide distribution, we must place *Cardui* at the head of the list. It must be kept in mind, however, that this butterfly is a strong flyer, and of a roving disposition, and may have extended its area in comparatively recent times. On the other hand, it evidently belongs to a very ancient family, and the probabilities are in favour of its early existence.

Next in age to *Cardui*, even if not surpassing it, I am inclined to put *Hyale*, on account of its occurrence in South Africa. This is not the only European insect that inhabits that region, and it seems incredible that they should have all got there by migration across Africa in its *present* condition. In fact, their presence alone would suggest the probability of a more temperate climate having once prevailed in tropical Africa, but we have other and stronger evidence that such was really the case during the Glacial Period. When intense cold, with extensive ice-sheets and snow-fields, covered the greater part of Europe, the meteorological conditions of the African Continent must have been materially affected, and the greater part of the European temperate fauna and flora must have been driven to take refuge on the south side of the Mediterranean, which was then bridged, as it were, by several land connections between Europe and Africa. That many of the refugees penetrated far to the south there is evidence to show, from the species of arctic plants that still linger here and there on some of the African mountains. It is not demanding too much to suppose then that *Hyale* is at least as old as the Pre-Glacial Period, and probably *much* older. A similar age must be assigned to *Edusa*, which, though not present in South Africa, is there represented by a very close ally, as it also is by another in North America, the latter being indeed scarcely distinguishable.

To the species common to Europe and America a considerable antiquity may be allowed. In connection with them, the interesting question arises, "In which hemisphere did they originate?" or how did they pass from Europe to America, or *vice versâ*. Their origin may have been just as well in one as in the other, but I think there is a slight probability in favour of an American origin for at least some of them. Perhaps, however, their birthplace may have been in the circumpolar lands, which seem at one time to have had a rich fauna and flora, and where it is by no means impossible that many palæarctic species were developed. But be this as it may, most of the evidence for the line of passage from America to Europe, or Europe to America, is in favour of Behring's Straits, or rather of the land connection that formerly existed there. Not much can be said in favour of a passage by Iceland and Greenland, for between Greenland and America there seems to have been no direct land connection.

Let us turn now to the question of the antiquity of the species in Britain.

In the first place, it may be said that, with perhaps one or two exceptions, there is really no reason why any of the species may have been inhabitants of Britain for more than a few thousand years. Continental Europe is so close, that it is quite within the bounds of possibility that many of the species might have flown over, or been blown over, any time within (say) a thousand years. Still the probabilities are against this, and in favour of their arrival with the rest of our indigenous fauna and flora, which came to us across the dry bed of the German Ocean.

As regards plants and wingless animals, a certain amount of evidence as to the order of their arrival may be gathered from their existence or non-existence in various of the outlying groups of islands in proximity to Britain. If we find certain species in these islands, the probability is that they arrived there before the land connection was cut off, and that consequently they arrived in Britain at an earlier period than the species which (*ceteris paribus*) do not exist in these islands. But with butterflies such evidence is scarcely satisfactory. Furnished with wings, and of light gravity, they may have been introductions of a much later date. On the other hand, they may have once existed, but been killed out by altered climatic conditions, and from their perishable structure left no traces of their presence.

If, however, we arrange the species in the order in which their existence in the outlying islands would suggest, we arrive at the following results:—

Iceland was cut off before any of our species reached it, for though six butterflies have been very doubtfully recorded from that island, none of them are British species.

From the Færöe Islands I have seen no record of the occurrence of any butterflies.

From Shetland only three species have been recorded, viz., *Atalanta*, *Cardui*, and *Typhon*.

In Orkney the following have been noticed:—*Atalanta*, *Cardui*, *Typhon*, *Brassicæ*, *Rapæ*, and *Icarus*.

In the Hebrides, *Brassicæ*, *Typhon*, and *Icarus*.

In Ireland thirty-nine or forty species, of which a list was given at the beginning of this paper, and which include in their number all the few species of the other islands.

If any dependence can be placed on evidence such as this, one might conclude that *Typhon* was one of the earliest to come to Britain, and seeing that it is an arctic species, and considering the nature of the places which it inhabits, and the food-plant of its larva, I think some justification may be found for this belief.

Next in order to it I should be inclined to place *Icarus*, which is also an arctic species.

As for the others just mentioned, not much can be learnt from their occurrence. *Cardui* and *Atalanta* are both strong flyers and wanderers; *Brassicæ* and probably *Rapæ* are both probably recent introductions with cultivated cruciferous plants.

We now come to the forty Irish species. As has been already mentioned, many naturalists hold, and on good grounds, that the main part of the fauna and flora of Ireland reached that island by way of Scotland, and that, in fact, the species were Scottish before they became Irish. But, however true this may be for some groups, it is, I venture to think, only partly applicable to the Lepidoptera.

It will be remembered that at the time when the British Islands were receiving the bulk of their animals and plants, and when there was land connection between the Continent and the various islands, that a large lake of considerable breadth extended from Wales to beyond the North of Ireland. From this lake a large river flowed south, and being joined probably by the Seine and other French rivers, emptied itself into the Atlantic. That this lake and river formed an effectual barrier to the passage of many animals and plants, and necessitated their passing round the head of the former, and so reaching, by way of Scotland, the North of Ireland, may well be believed. But it seems quite possible that many Lepidoptera were able to fly across the river. If such was the case, there is no need of believing that the butterflies common to England and Ireland, but not now found in Scotland, passed through Scotland on their way to Ireland. In fact, some of them need not necessarily have passed through the present area of England either. Hence the occurrence of certain species in Ireland does not present sure evidence of their arrival in Britain before the communication with Ireland was cut off.

Are there any other grounds on which we can base the relative antiquity in Britain? In the first place (as suggested at the beginning of this paper), the relations of the species to its food-plant; and, in the second, the range or distribution at home and abroad, may afford some evidence. In some cases these two factors may be considered together. Flowering plants (to which division all the food-plants of the British butterflies belong) may be classed as self-fertilised or anemophilous (or wind fertilised), and entomophilous, or requiring for the most part insect-agency for fertilisation. It is reasonable to suppose that the first of these —the self-fertilised and anemophilous plants—would establish themselves before the entomophilous plants (the reader will remember that the ice-age had cleared Britain of every living thing, animal and vegetable), since the plants would precede the insects that fed on them, and the self-fertilised or anemophilous species would have an advantage at first over the entomophilous ones. Consequently, the insects which fed on the self-fertilised and anemophilous plants would in like manner have at first greater facilities for establishing themselves than the entomophilous plant eaters. Similarly, as annual and low-growing plants sooner reach maturity than perennial herbs and plants of a shrubby or arboreal nature, the insects which find their food on them would have a slight advantage.

Again, on the other hand, it is not unnatural to suppose that the butterflies which are now found within the arctic circle were better fitted to follow closer the retreating ice-sheets and snow-fields than those species which are not found outside the more temperate regions.

We will now see how these theories work with the British butterflies. Of the twenty-one which are arctic, the greater number feed on low plants, which are either wind-fertilised or more or less adapted for self-fertilisation. Along with the arctic species two others may be taken, viz., *Epiphron* and *Æthiops*, which, though not arctic, are alpine and subalpine. Their larvæ live also upon anemophilous plants. Keeping in mind then the food-plants, the distribution of the insects, and the nature of the localities which they inhabit, we may arrange these twenty-three in the following manner, indicating the order of their arrival in Britain:—

1. *Typhon*, *Pamphilus*, *Epiphron*, *Æthiops*, feeders on grasses and sedges, and inhabiting moory ground, such as we may suppose to have been formed early in post-glacial times.

2. *Icarus*, *Phlæas*, *Tithonus*, *Aglaia*, *Euphrosyne*, *Selene*, *Lathonia*, *Athalia*, *Urticæ*, *Napi*, *Cardamines*, also feeders on low plants either wind-fertilised or chiefly adapted for self-fertilisation. Many of them also inhabiting moory situations.

3. *Astrarche*, *Machaon*, *Comma*, *Ægon*, *Semiargus*, *Rubi*, *Malvæ*, *Antiopa*, mostly feeding on plants where cross fertilisation by insect-agency prevails, some of them being also of a shrubby nature.

The remaining species, which are not arctic, may be arranged in like manner:—

1. *Semele*, *Megæra*, *Janira*, *Hyperanthus*, *Ægeria*, *Sylvanus*, *Thaumas*, *Palæmon*, *Actæon*, *Atalanta*, *Io*, *Cinxia*, *Adippe*, *Galathea*, *Sinapis*, *Daplidice*, *Brassicæ*, all feeders on low plants that are mostly wind or self-fertilised.

2. *Corydon*, *Arion*, *Minima*, *Bellargus*, *Hyale*, *Edusa*, *Aurinia*, *Cardui*, feeders on low plants mostly cross-fertilised.

3. *Lucina*, *Cratægi*, *Rhamni*, *Polychloros*, *C-album*, *Betulæ*, *Pruni*, *W-album*, *Sibylla*, *Argiolus*, *Quercus*, *Iris*, almost all feeding on plants of a shrubby or arboreal nature, many of them requiring cross-fertilisation. The insects, too, are partial to woodlands, and possibly did not come in till the forest period.

In conclusion, the facts or theories briefly alluded to in the foregoing pages may be thus summarised :—

1. Britain derived its butterfly fauna from continental Europe in post-glacial times.

2. The absence of certain English species from Scotland and Ireland is not due to latitude, but possibly because the climate is too "insular."

3. The absence from Scotland of certain English and Irish species is possibly due to temperature.

4. The absence from Ireland of some English and Scottish species appears not to be due to climate, but to the separation of Ireland before these species could reach it.

5. The most widely-distributed species are probably the most ancient.

6. The occurrence of species of butterflies in the outlying islands does not of itself afford sufficient evidence for or against their having reached the islands before the land connection was severed.

7. Though part of the fauna of Ireland reached it by way of Scotland, some of the butterflies probably entered it by the south.

8. Arctic and alpine species probably colonised Britain before species which are neither arctic nor alpine.

9. Species whose larvæ feed on low growing self- or wind-fertilised plants would find their food-plants established before those which feed on cross-fertilised or shrubby plants, and hence be able to establish themselves sooner.

10. Species combining the advantages of 8 and 9 were most probably the first colonists.

Annat Lodge, Perth, November, 1881.

FURTHER NOTES ON THE MACRO-LEPIDOPTERA OF THE SHETLAND ISLES.

By J. Jenner Weir, F.L.S., F.Z.S.

In the 'Entomologist' last year (Entom. xiii. pp. 249—251 and 289—291) I gave some account of the Macro-lepidoptera of the Shetland Isles, which had been obtained by a collector in the employ of Mr. Meek. Emboldened by the success which had attended Mr. Meek's laudable enterprise, Mr. M'Arthur, the collector in question, has visited the islands this year, and by prolonging his stay to a somewhat later period has extended our knowledge of their lepidopterous fauna.

Mr. M'Arthur has added thirteen species to the list given by me last year, viz.:—

Pyrameis Atalanta.
Hydræcia micacea.
Apamea basilinea.
Miana fasciuncula.
Celæna Haworthii.
Caradrina cubicularis.
Noctua C-nigrum.
Hadena dentina.
Plusia gamma.
Emmelesia blandiata.
Cidaria immanata.
Cidaria testata.
Carsia imbutata.

By these additions the total number of Macro-lepidoptera observed in the Shetland Isles has been increased to thirty-eight.

The period during which the collection was made extended from the second week in May until the middle of September. The season was one of the worst known by the inhabitants, being both very wet and cold; so that Mr. M'Arthur was obliged to wear an overcoat during the whole of the summer; the prevailing winds were north-west and south-west.

Of the thirteen new species taken but few present any difference in colour from the ordinary Scottish or English type, and, beyond including their names in the list of captures, call for no further remark; but, on the other hand, some present differences of colour from the normal type such as to render them worthy of notice.

Hydræcia micacea.—Some of the specimens taken are of a darker and richer red than any I have previously seen, but others approach more nearly to the normal colour.

Celæna Haworthii.—The markings are very distinct, and the ground colour somewhat redder than usual; the specimens upon the whole have a richer appearance.

Hadena dentina.—Some of those taken are very darkly coloured, whilst others present but little difference from the English type of the species.

Emmelesia blandiata.—A beautiful series of this charming little moth was taken; the markings are more distinct than usual, and the central dark band is complete, or but slightly interrupted.

Cidaria immanata.—A great number of this species have been captured; the general hue is redder in colour than is usually found to be the case. In this respect they present a noticeable contrast to the examples from the Hebrides of the allied species *Cidaria russata*, which were remarkable for their grey hue, as mentioned in my paper in this magazine for the current year (Entom. xiv. 218—223). It is worthy of note that in the Shetland Isles *C. immanata* alone was taken; and in the Hebrides *C. russata* appears, from the collections made, to be the only indigenous species of these two insects. Some of the specimens of *C. immanata* are decidedly of a rufous colour on the disk of the upper wings, approximating thus in coloration to *C. russata*, to which latter species such a distribution of colour has hitherto been thought to be confined, *vide* the diagnosis of the two species given in Newman's 'British Moths.'

Cidaria testata.—The specimens of this insect are generally much darker than any I have seen before; the central band in some is very dark, almost lead-coloured, and there is also an entire absence of yellow on the wings. I regard them as amongst the most interesting captures.

I will now add a few further remarks on some of the species dealt with last year, in my paper above quoted.

Hepialus velleda var. *Hethlandica*, Stgr.—The males of the ordinary normal type were far more numerous this than last year, in the collections made; and on speaking to Mr. M'Arthur on this subject he informed me that the weather being so very wet at the time the insect appeared on the wing, he captured all he saw of the comparatively small number which were to be had; but last year the weather having been fine, and the insect, as a consequence, more abundant, he had disregarded the silvery males, and had generally confined his attention to the more remarkable aberrations. It would, therefore, appear that the normal type of the male is more common in Shetland than the collection made last year had led one to infer.

Hepialus velleda.—A very fine series of the beautiful insular varieties of this insect have been captured. The females have the ground colour of the wings pale, the markings thus appear very distinctly. The nearly unicolorous variety, the *Hepialus carnus*, Steph. (non Fab.), does not appear to be found.

Nemeophila plantaginis.—The upper wings of some of the males have almost a white ground colour; on the other hand, some of the females are of a very rich yellow, approaching almost to red on the costa and anal angle of the wing.

Pachnobia hyperborea.—This insect, which remained until 1876 for so many years unique in Mr. Douglas's cabinet, has again been taken by Mr. M'Arthur in some numbers and in great variety.

Dasypolia templi.—As remarked in my paper, last year, out of the specimens taken two were very light in colour. The insect has been captured this year, and the light variety has again been found; but a variety has also appeared very much darker and browner than the usual type, and with two darker bands through the centre of the upper wings.

Anarta melanopa.—The ground colour of the upper wings is much yellower than that of the insect obtained at Rannoch.

Emmelesia albulata var. *Thules.*—A very fine series of this insect has been taken, varying, however, in the extent of the obliteration of the bands on the wings. One I have now before me is almost wholly lead-coloured, with a faint indication of a central band.

Eupithecia venosata.—Some of those taken this year, although of the leaden ground colour, mentioned in my previous paper, have the markings more clearly defined.

Melanippe montanata var. *Shetlandica.*—Mr. M'Arthur has captured a very fine series of this beautiful insular variety. There is a considerable variation in the colour of the wings; but where the ground colour is suffused the markings are faint, and where the ground colour of the wing is white the markings are well defined.

Mr. M'Arthur has also preserved in excellent condition the larvæ of the following species, viz.:—*Dianthœcia conspersa*, showing the caterpillar at different ages, and also as feeding within the capsule of *Silene maritima; Pachnobia hyperborea* on *Empetrum nigrum; Nemeophila plantaginis* on *Calluna vulgaris;* and *Larentia cæsiata.*

I have to thank Mr. M'Arthur for so kindly allowing me to inspect and describe the valuable collection he has made.

6, Haddo Villas, Blackheath, November, 1881.

CARADRINA AMBIGUA, W. V.

A LEPIDOPTERON NEW TO THE BRITISH FAUNA.

BY EDWARD G. MEEK.

WHILE on a recent visit to Brighton I was looking over some insects belonging to Mr. A. Vine, of Temple Street, in that town, and found four specimens of a *Caradrina* so different from any other British species that I obtained permission to compare them with the moths of that genus in the Doubleday collection of European Lepidoptera at Bethnal Green Museum. On comparison I immediately found Mr. Vine's species was identical with *Caradrina ambigua*, in which opinion I am since confirmed.

The anterior wings of this addition to our fauna may be distinguished from any other British *Caradrina* by the conspicuous yellowish white margins of the reniform and orbicular stigmas; from *C. blanda* by a pale yellow line edging the inner portion of the cilia of the front wings. From both that species and *C. alsines* it is also distinctly separated by the pearly white under wings. The grey ground colour of the front wings reminds one of *C. cubicularis*, from which, however, the other characters render it quite distinct.

Mr. Vine captured the four specimens on one evening in September, 1879, at sugar, near Shoreham, Sussex. Although its captor has since repeatedly sugared on the same ground, he has never seen another example.

56, Brompton Road, London, S.W., November, 1881.

[*Caradrina ambigua* is said to occur throughout Southern Europe, and not to be a common species. In our collections it will be placed between *C. blanda* and *C. cubicularis*.—ED.]

ON THE COLOURS OF FLOWERS AS AN ATTRACTION TO BEES.

By Sir John Lubbock, Bart., M.P., F.R.S., Pres. Linn. Soc.

(Abstract of a Paper read before the Linnean Society, November 17th, 1881.)

After some prefatory remarks, and criticisms of an experiment by M. Bonnier, Sir John Lubbock said:—

"I do not think, however, that any satisfactory result could be expected from this experiment. In the first place, after the first five minutes there were about thirty bees on each cube, and in less than ten minutes nearly a hundred, and the colour therefore must have been almost covered up. The presence of so many bees would also attract their companions. Moreover, as the honey was all removed in less than twenty minutes, the bees were evidently working against time. They were like the passengers in an express train, turned hurriedly into a refreshment room; and we cannot expect that they would be much influenced by the colouring of the table. In fact, the experiment was too hurried and the test not delicate enough.

Then, again, he omitted blue, which I hope to show is the bees' favourite colour, and his cubes were all coloured. It is true that one was green; but any one may satisfy himself that a piece of green paper on grass is almost as conspicuous as any other colour. To make his experiment complete, M. Bonnier should have placed beside the honey on the coloured cubes a similar supply without any accompaniment of colour to render it conspicuous.

I could not, therefore, regard these experiments as at all conclusive. The following experiments seem to me a more fair test:—

I took slips of glass of the size generally used for slides for the microscope, *viz.* 3 inches by 1, and pasted on them slips of paper coloured respectively blue, green, orange, red, white, and yellow. I then put them on a lawn, in a row, about a foot apart, and on each put a second slip of glass, with a drop of honey. I also put with them a plain slip of glass, with a similar drop of honey. I had previously trained a marked bee to come to the spot for honey. My plan then was, when the bee returned and had sipped about for a quarter of a minute, to remove the honey, when she flew to another slip. This then I took away, when she went to a third; and so on. In this way I induced her to visit all the drops successively. When she had returned to the nest, I transposed all the upper glasses with the honey, and also moved the coloured glasses. Thus, as the drop of honey was changed each time, and also the position of the glasses, neither of these could influence the selection by the bee.

In recording the results I marked down successively the order in which the bee went to the different coloured glasses. For instance, in the first journey from the nest, as recorded below, the bee lit first on the blue, which accordingly I marked 1; when disturbed from the blue, she flew about a little and then lit on the white; when the white was removed, she settled on the green; and so on successively on the orange, yellow, plain, and red. I repeated the experiment a hundred times, using two different hives, and spreading the observations over some time, so as to experiment with different bees and under varied circumstances. Adding the numbers together, it of course follows that the preference shown for each colour is inversely as the number standing against it. If we add together 1, 2, 3, 4, 5, 6, and 7, we get 28 as the total for each journey, and dividing this again by 7, if no preference were shown, the number for each colour would be 400.

I now subjoin the numbers, giving the first day *in extenso*:—

Journeys.	Blue.	Green.	Plain glass.	Orange.	Red.	White.	Yellow.
1.	1	3	6	4	7	2	5
2.	5	4	7	6	1	2	3
3.	1	4	7	6	5	3	2
4.	2	4	6	7	5	1	3
5.	1	4	7	2	6	5	3
6.	1	2	3	6	5	4	7
7.	2	1	4	7	3	5	6
8.	3	4	6	2	7	5	1
9.	5	1	7	4	6	3	2
10.	1	6	7	5	3	2	4
11.	4	6	5	2	7	3	1
	—	—	—	—	—	—	—
	26	39	65	51	55	35	37

In the next series of experiments the bees had been trained for three weeks to come to a particular spot on a large lawn, by placing from time to time honey on a piece of plain glass. This naturally gave the plain glass a great advantage; nevertheless, as will be seen, the blue still retained its pre-eminence. It seems hardly necessary to give the others *in extenso.* The following shows the general result of the number of visits in one hundred experiments extending over nine days:—Blue, 275; green, 427; orange, 440; plain, 491; red, 413; white, 349; yellow, 405. The precautions taken seem to me to have placed the colours on an equal footing; while the number of experiments appears sufficient to give a fair average. It will be observed also that the different series agree well among themselves. The difference between the numbers is certainly striking. Adding together 1, 2, 3, 4, 5, 6, and 7 we get 28 as the total number given by each journey; 100 journeys therefore give a total of 2800, which divided by 7 would of course, if no preference were shown, give 400 for each colour. The numbers given, however, are—for the blue only 275, for the white 349, yellow 405, red 413, green 427, orange 440, and plain glass as many as 491.

Another mode of testing the result is to take the percentage in which the bees went respectively to each colour first, second, third, and so on. For instance, that out of a hundred rounds the bees took blue as one of the first three in 74 cases, and one of the last four only in 26 cases; while, on the contrary, they selected the plain as one of the first three only in 25 cases, and one of the last four in 75 cases.

I may add that I was by no means prepared for this result. Müller, in his remarkable volume on 'Alpine Flowers,' states that bees are much more attracted by yellow than by white.*

I may very likely be asked why it is that if blue is the favourite colour of bees, and if bees have had so much to do with the origin of flowers, how is it that there are so few blue ones? I believe the explanation to be that all blue flowers have descended from ancestors in which the flowers were green, and that they have passed through stages of white or yellow, and generally red, before becoming blue. That all flowers were originally green and inconspicuous as those of so many plants are still, has, I think, been shown by recent researches, especially those of Darwin, Muller, and Hildebrand.

But what are the considerations which seem to justify us in concluding that blue flowers were formerly yellow or white? Let us consider some of the orders in which blue flowers occur with others of different colours.

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* Alpenblumen, p. 487.

For instance, in the Ranunculaceæ,* those with simple open flowers, such as the buttercups and Thalidiums, are generally yellow or white. The blue Delphiniums and Aconites are highly specialized, abnormal forms, and doubtless, therefore, of more recent origin. Among the Caryophyllaceæ the red and purplish species are amongst those with highly specialized flowers, such as *Dianthus* and *Saponaria*, while the simple open flowers, which more nearly represent the ancestral type, such as *Stellaria*, *Cerastium*, &c., are yellow and white. I cannot, therefore, concur with Hildebrand in considering that red was the original colour of the family."

The author then proceeded further to discuss the subject of the colours of flowers, and concluded by saying:—

"However this may be, it seems to me that the preceding experiments show conclusively that bees do prefer one colour to another, and that blue is distinctly their favourite."

Sir John Lubbock then made some most interesting remarks upon the Identification of Companions in Ants, on the Recognition of Relations, Peculiarities of Manner, Longevity, and on the genus *Anergates* of the same group of insects, to which subjects we shall on a future occasion refer.

NOTES ON DIPTERA.

By R. H. Meade, F.R.C.S.

Dipterous insects, being mostly small in size and sombre in colour, will never excite much interest in the imago or perfect form; but the naturalist who will take up the study of their preliminary states, and endeavour to make out their life-history, will be rewarded for his trouble by the interest he will find in the pursuit. Many species mine the leaves of plants, and the leaves so affected may be easily known either by the blotches or blisters which the larvæ of the larger flies (*Anthomyiidæ* and *Trypetidæ*) produce, as they separate the two layers of the leaf from each other by eating the cellular succulent tissue between them, or by the tortuous lines which show the course of the mines made by the larvæ of the small mining Diptera (*Phytomyzidæ*, &c.). If these leaves are gathered while the larvæ are at work, and kept in a moist place,—as a wide-mouthed bottle with some damp earth at the bottom, or in a glass-topped box,—the gatherer will in time be rewarded by the emergence of the imago, which is often of great beauty, as the *Trypeta Zoë*, which mines the leaves of the ragwort and groundsel, or the *Acidia heraclei*, which blotches those of the garden celery. Most of these flies are double-brooded, and the leaves gathered in the beginning of summer will produce the perfect insects in about a month, while from those collected in the autumn or latter part of summer no flies must be expected to emerge until the following spring.

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* I take most of the following facts from Müller's admirable work on Alpine Flowers.

My friend Mr. Inchbald is quite an enthusiast in this department, and I have been enabled to clear up the life-history of several interesting species by means of his investigations.

It is not to the subject of mining Diptera, however, that I now seek to direct especial attention, but to another tribe of equal interest,—that of parasites; those flies, for instance, which pass the first and most important stage of their existence in eating the bodies of other insects, especially of Lepidoptera, whose larvæ they destroy, and thus perform a very useful work in Nature, though one not always appreciated by the collector.

The parasitic class of insects is a very large one, and a great part of it consists of Hymenoptera. I am glad to say that this division has lately received much attention, especially at the hands of Messrs. Fitch and Bridgman. The dipterous parasites, on the contrary, are very little known; and the family of the *Tachinidæ* is the most difficult one to study in the whole order of Diptera. A large number of these flies have been described and named, but very few have been traced to their origin. If lepidopterists would carefully preserve all that they breed from the pupæ of moths or butterflies, and note the species from which each one emerged, the life-history of this interesting family might soon be rescued from its present obscurity. I will gladly endeavour to name any specimens so bred, if they are forwarded to me.

With the exception of a list of European *Tachinidæ* and their feeders, arranged side by side, which was compiled by the late Francis Walker, and published in the 'Cistula Entomologica' (pars X., September, 1874), no systematic attempts have, I believe, been made to arrange the different species of parasite, together with those of their victims; and at present the amount of information on the subject is too small to enable me to place them in any order. A good many facts have been recorded by R. Desvoidy, Macquart, Zetterstedt, Schiner, Rondani, and others; and I will endeavour to add my mite to the stock of information on the subject by recording those facts that have fallen under my own observation.

The parasitic Diptera do not all belong to the *Tachinidæ*, though this may be named the family of parasites "par excellence." Some of the little flies belonging to the genus *Phora* have been bred from the pupæ of other insects, but not much is known about them. Two instances of this kind have fallen under my own observation, *viz.*, in December, 1880, I received a specimen of *Phora minor ?* Zett., from Mr. Fitch, which he had bred from the larva of a sawfly (*Nematus salicis*); and a few days since Mr. C. Waterhouse sent me one of *Phora rufipes*, Meig., bred from *Nematus ribesii*.

Some of the *Sarcophagæ*, or flesh flies, have been bred from the larvæ of other insects. I was much interested by receiving several specimens of *Sarcophaga lineata*, Fallen, in September last, from Sir Sidney Smith Saunders, which had been bred from the locusts (*Œ. cruciata*) in the Troad, and to which they were said to have been very destructive. A closely allied species (*S. affinis*, Fall.) has been reared from two or three species of *Tinea*. The larvæ of the flesh flies mostly live upon dead animal substances; and Schiner* thinks it doubtful whether they are ever true parasites, but only feed upon the larvæ or pupæ of insects which have died from other causes. Should this surmise be correct, will it not apply also to the larvæ of the *Phoræ*, which have been found in other larvæ ?, for these little flies are mostly reared from decaying vegetable and animal (?) matters. In the United States Professor Riley found the larvæ of *Anthomyia angustifrons*, Meig., very destructive to the locust eggs, while *Tachina anonyma*, Riley, and *Sarcophaga sarraceniæ*, Riley, were parasitic on the locusts themselves.

Lastly, with respect to anomalous parasites, I may mention that Mr. Bridgman lately sent me three female specimens of the common *Dilophus vulgaris* (*Bibionidæ*), together with their pupa-cases, which had been bred, as he informed me, by Mr. F. Norgate from larvæ of *Catoptria hypericana*. The *Dilophi* have always been supposed to be vegetable feeders, the larvæ eating the roots of grass, &c. They often swarm in great numbers in the autumn, and I need not say that this is not the habit of the parasitic flies, which though numerous as species are scarce as individuals. I think there must have been some mistake in the matter, but record the observation to stimulate further researches.

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* 'Fauna Austriaca' (Diptera), vol. i. p. 568.

I will now conclude my remarks by giving a list of those Tachinids whose origin is known to me. It will be seen that some prey upon a number of different larvæ, while others appear always to attack the same species. I shall follow no arrangement, but commence with the most common parasite.

EXORISTA VULGARIS, Fallen.

I have received specimens of this fly from several correspondents, whom I will mention in alphabetical order, giving the names of the insects from which they were bred.

Mr. Bignell, of Stonehouse, sent me specimens bred from *Tæniocampa stabilis*, *Polia flavocincta*, *Notodonta camelina*, *Hybernia defoliaria*, *Vanessa urticæ*, *Tortrix ribeana*, *Abraxas grossulariata*, and *Eubolia cervinaria*.

Mr. Bridgman, from *Sphinx ligustri*.

Mr. Fitch, from *Simyra venosa*, *Phlogophora meticulosa*, and *Zygæna filipendulæ*.

Mr. Fletcher, of Worcester, from *Pieris rapæ* and *Abraxas grossulariata*.

Mr. Mosley, of Huddersfield, from *Odonestis potatoria* and *Anthocharis cardamines*.

Mr. Porritt, of Huddersfield, from *Odonestis potatoria*.

This ubiquitous parasite varies so much in size, colour, and even in structure, that several varieties have been made by R. Desvoidy and Macquart into distinct species; most of these are, doubtless, only varieties of one species, but I believe that two or three distinct ones have been confounded together, though I have not yet been able to separate them by any really distinctive characters.

EXORISTA GRANDIS, Zett.

This fine species has been bred from *Saturnia carpini* by Mr. Bignell, Mr. Fitch, Mr. Mosley and Mr. Sang.

EXORISTA HORTULANA, Meigen.

I have received this species from Mr. Bridgman and also from Mr. Porritt, by both of whom it was bred from *Acronycta alni.*

EXORISTA AFFINIS, Fallen.

Mr. Bridgman sent me specimens of this species bred, together with the last, from *Acronycta alni*; and I have also received it from Mr. Fitch, who reared it from a larva of the same species. It appeared such a remarkable circumstance that two distinct but closely-allied parasites should be bred at the same time from the same larvæ that I was led to examine them very carefully, and suspect that the flies which I have severally named *E. hortulana* and *E. affinis* are only varieties of the same species, which is probably new, as it does not exactly agree with the descriptions given of either of the above species.

EXORISTA LOTA, Meig.

Mr. Dale sent me specimens bred from *Tæniocampa stabilis;* and Mr. Fletcher one from *Acronycta psi.*

EXORISTA PARENS, Rondani.

I have received this species from Mr. Bignell, bred from *Polia flavocincta.*

NEMOREA NOTABILIS, Meig.

Mr. B. Cooke gave me a specimen of this species, bred from *Botys verticalis;* and I have received another from Mr. Porritt, reared from the larva of the same species.

PHOROCERA CONCINNATA, Meig.

Mr. Fletcher has bred this fly from *Acronycta aceris.*

TACHINA LARVARUM, Linn.

This large parasite has been bred by Mr. Bignell from *Zygæna filipendulæ.*

BAUMHAUERIA VERTIGINOSA, Meig.

Mr. Fitch has bred this from the larva of *Chelonia caja.*

SCOPOLIA OCYPTERINA, Zett.

Mr. Butler sent me this species, reared from *Pterophorus tephradactylus.*

THELAIRA LEUCOZONA, Panzer.

This parasite—which is placed in the family of the *Dexiidæ* instead of the *Tachinidæ*, in consequence of its having a plumose arista—has been bred by Mr. Butler from *Chelonia caja.*

Bradford, Yorkshire, October, 26, 1881.

DIPTEROUS PLANT-MINERS IN THEIR PERFECT STATE

By Peter Inchbald, F.L.S.

In a paper on the subject of plant-miners, which I communicated to this magazine last autumn (Entom. xiv. 41), I spoke of the *earlier* stages of these plant-mining Diptera,—their larva and pupa state,—together with their habits of life and phases of development. This year I have been fairly successful in rearing the imagines, and I gladly place my observations, such as they are, in the hands of those of your readers who may be interested in our mining Diptera. I must mention at the very outset that I have had the privilege of the diagnoses of Dr. Meade, of Bradford, in the identification of most of those species that I have happened to rear; diagnosis in species so closely allied is in many cases very difficult. My very best thanks are due to him, as are those of our dipterists generally, for the patience and perseverance he has shown in his discriminations. As in my previous paper I will give the various classes of plants, and the Diptera that affect them.

Ranunculaceæ.—*Ranunculus repens* yielded me, though scantily, *Phytomyza flava*, Fallen. It is a pretty little fly, and very lively in its movements. The pupa from which it emerged is shining bottle-green in colour. The imagines began to appear on the 10th of July. Dr. Meade remarks that *P. flava* was the name given to it by Fallen in 1823. Goureau and Desvoidy have since described it under the name *Ranunculi*, a better name, perhaps, if the insect should prove an exclusive feeder on *Ranunculus*. Fallen seems to have known nothing of the food-plant. The leaves of the columbine of our gardens showed extensive mining in the autumn of 1880. Sometimes two mines occupied one leaf. They pupated within the glass-topped box, the pupa being of a shining amber-colour. The imagines appeared in the spring of 1881, and proved to be the *Phytomyza ancholæ* of Goureau and Desvoidy, which is identical with the *Phytomyza obscurella* of Fallen. I bred fully a dozen of this fly in May of the present year.

Umbelliferæ.—*Phytomyza albiceps*, the feeder on *Heracleum*, I find bestows his attentions on various *Compositæ*, as well as *Umbelliferæ*. I have bred this fly from ivy-leaved lettuce (*Lactuca* *muralis*), as also from dandelion and nipplewort (*Lapsana*). It is probably, therefore, the most polyphagous of the group. This bears out the remarks of Scholtz and Hardy, who find the fly mining such various vegetation. Fully a dozen distinct plants afford food to *P. albiceps*, according to their observations. Another beautiful fly is *Trypeta onopordinis*, which mines our celery leaves, often damaging the crop, though not so seriously as to interfere with its growth. It was first described by Linnæus, in his 'Fauna Suecica,' in 1771; he found it mining the leaves of *Heracleum*. It is now called *Acidia heraclei*, L. The affected celery leaves were gathered on the 17th of July, and the imagines emerged from pupahood on the 17th of August.

Cruciferæ.—Though not a miner, but a root-feeder, I would draw attention to a fly, *Chortophila floccosa*, Macquart, which is destructive in the larva state to our young savoys. The plants that were affected died from the loss of their rootlets. I bred both male and female. The tufts of hairs on the posterior thighs serve to identify the species. Dr. Meade remarks that nothing of its life-history in connection with its food-plant has been previously recorded.

Labiatæ.—I succeeded this year, for the first time, in rearing the gall-gnat of the ground-ivy. It is instrumental in forming those reddish purse-like galls on the leaf of the ground-ivy. I gathered the galls in the autumn of 1880, and the imago put in an appearance on the 28th of the May following. The structure of the gall itself is as marvellous as it is mysterious. The opening of the cone-shaped purse is on the under side of the leaf, and in this purse the larva lives, feeds, and pupates, putting on wings, as I have said, in the following May. The name of the gall-gnat is *Cecidomyia bursaria*, Bremi.

Chenopodiaceæ.—Here, again, we find probably the whole family mined by *Chortophila betæ*, Curtis, the pest of our mangold fields. I have bred the identical fly from Chenopod-spinach, mangold and beet this year, and this is possibly not surprising, as the juices and mucilage of the group would doubtless make it generally available for culinary purposes, like the spinach. I hear, indeed, of a sea-coast Chenopod (*Schoberia maritima*) furnishing food to *C. betæ* on the Sussex coast. Thus it is more than probable that the fly may adapt itself to circumstances in obedience to the season and its food-supply.

Polygonaceæ.—I have bred in tolerable abundance the miners of the sorrel and dock. From the sorrel, *Pegomyia nigritarsis*, Zett., and *Chortophila transversalis*, Zett. The former species, says Dr. Meade, has been confounded with *P. fulgens*, Meigen; but Rondani says they are distinct, the true *P. fulgens* having a yellow scutellum. It is somewhat doubtful whether the continental *P. fulgens* has been seen in Britain. From the dock (*Rumex obtusifolius*), *Pegomyia nigritarsis* of Zetterstedt, and *P. bicolor*, Wiedmann; very possibly, as Dr. Meade remarks, feeding within the same leaf. Robineau Desvoidy and Schiner both suspected the distinctness of the miners of the sorrel-dock. From the sorrel I bred largely; I had fifty pupæ, but all proved to belong to one species. I had ninety-six pupæ of the dock, and from these two species presented themselves.

Aquifoliaceæ. — I had abundantly *Phytomyza aquifolii*, Walker, from blotched holly leaves. This insect—so common with us, as to blotch in some seasons nearly every leaf—is not mentioned by Schiner, Meigen, or Zetterstedt. I had a score at one time in my breeding box. It differs, says Dr. Meade, from *P. obscurella*, Fall., in the lower part of the face (untergesicht), being pale yellow. In *P. obscurella* it is dusky; moreover the venation of the wings is different.

Compositæ.—From the blotches of the burdock leaves I hatched, early in May, both male and female flies of *Chortophila conformis*, Fallen. Dr. Meade informs me that the male was previously unknown; and remarks further that it closely resembles the *C. rimans* of Rondani, according to the description which he gives of the female of that species, of which he did not know the male. Another Composite, the groundsel, yielded me, in fair abundance, the beautiful *Spilographa Zoë*, Meig., which Bremi bred also from groundsel. It is one of the *Trypetidæ*, whose lively, fanning, movements I so much admire. The larva of this fly feeds within the leaves of the groundsel, usually near the midrib. The pupa is pale yellow. I reared plenty, both of the male and female.

Fulwith Grange, Harrogate, October 24, 1881.

THE GENUS *PHÆDON.*

By the Rev. W. W. Fowler, M.A., F.L.S.

As there seems to be so much misunderstanding about the different species of the genus *Phædon*, it may perhaps be useful to say a few words concerning the group, especially as the subject has been lately discussed in the pages of the 'Entomologist.' Stephens places fourteen species in this genus, including in it our genera *Plagiodera*, *Prasocuris*, *Phratora*, *Phædon*, *Gastrophysa*, and one *Chrysomela*, viz. *fastuosa*. Of all these none, except *Plagiodera*, have any affinity to the *Phædons* proper. It might seem, indeed, at first sight, that *Plagiodera armoraciæ* was a real *Phædon;* it is, however, generally distinguished by the ventral segments of the abdomen, and by its much flatter and less convex appearance. It is decidedly a rare insect, and I have not heard of its being taken since Mr. G. C. Champion found it a few years ago. It is said to be found beneath the bark of willows, or at the roots of grass in marshy places; the latter habitat seems to agree better with the nature of the whole group, and very probably the willow bark only serves it as a refuge from weather, or as winter-quarters, as it is a very common thing to find allied species of the *Chrysomelidæ* under bark of trees in winter. We have, then, left, four species of *Phædon* proper, which may be treated of in order:—

Phædon tumidulum, Kirby.—This species, which has no synonyms, is easily distinguished by its thorax being distinctly punctured at the base only, the rest being smooth; it is of a dull dark blue or olive-green colour, and not very variable. It is exceedingly abundant in spring and summer on hedge-sides and ivy banks; in fact I have seldom swept any locality without coming across it somewhere or other. I never remember, though, to have found it on marshy, or even damp, ground.

Phædon betulæ.—Dr. Sharp, in his Catalogue, assigns this species to Linné, and gives the *P. betulæ* of Waterhouse's Catalogue as a synonym of *P. cochleariæ;* whereas in Waterhouse's Catalogue *Phædon armoraciæ*, Linné, *P. cochleariæ*, Fab., and *P. betulæ*, Suffr., are given as synonyms for one species; and *Phædon betulæ*, Linné, and *P. cochleariæ*, Suffr., are given as synonyms of another species. It is very probable that some confusion has arisen at some time or other between *Plagiodera armoraciæ* and *Phædon armoraciæ*, which latter is plainly the insect that we are to understand by the *P. betulæ* of Dr. Sharp's Catalogue, as they are exceedingly alike at first sight, owing to their very prominent shoulders and general appearance. I think, then, that this *P. betulæ*, which stands next on our list to *P. tumidulum*, is Linné's *Chrysomela armoraciæ*, and not the insect he meant by *C. betulæ*. It is a very distinct species, and is easily distinguished from *P. tumidulum*, which it much resembles at first sight, by its thorax being distinctly punctured all over, and by its very prominent shoulders. I have always found it an uncommon insect, and have never taken it, or heard of its being taken, except in damp or marshy places.

Phædon cochleariæ.—This is usually considered to be the *Chrysomela cochleariæ* of Fabricius, although Mr. Waterhouse apparently considers Fabricius's insect to be synonymous with the preceding species. Thomson (Skand. Coleopt., viii. 273), assigns it to Fabricius, and his authority is of great weight. If Linné by his *C. betulæ* meant one of our *Phædons*, and not *Phratora vulgatissima* or some quite different insect, I am inclined to think that it is this species to which his name must be attached. This is the insect referred to in the 'Entomologist' for this present year by Mr. Hart (Entom. xiv. 187) and by Mr. Billups (Entom. xiv. 237). It is easily distinguished from the other species by the punctuation of its thorax, its less convex shape, and the peculiar brightness of its colour; it seems peculiar in that it appears to have no particular preference for either dry or marshy ground. Mr. Billups has shown how abundantly he has found it on a dry field; and I have taken it in company with the preceding species in a marshy place near Repton, and on cruciferous plants growing actually in the water near Lincoln. This species is perhaps the most injurious to man either of this or the allied genera, as it seems to attack useful plants to a greater degree than its congeners.

Phædon concinnum, Steph.—This species is distinguished from the preceding by its rather more convex shape, and by its being almost universally of a bright green colour, *P. cochleariæ* being nearly always blue; the interstices of the elytra in *P. concinnum* are coarsely punctured and wrinkled, whereas in *P. cochleariæ* they are only very finely wrinkled. I have not heard of this insect having been lately taken in England; but Stephens mentions it as having been abundant at Southend; and this, as being a maritime locality, agrees perhaps with the locality from which I always receive it, *viz.*, the shores of the Solway Firth, near Dumfries. It seems never to be found away from the sea, and in general form and appearance is so like *P. cochleariæ* that it might be open to question whether it is not merely a race of this insect modified by a maritime life and different food. The first three species of *Phædon* (if we perhaps partially except *P. tumidulum*, which is found on many different plants) apparently feed on cruciferous plants of various kinds; it would, however, appear that *Phædon concinnum* cannot possibly obtain such food. I wrote to Mr. W. Lennon, of Dumfries, who has been most kind in supplying me with specimens of this species, and asked him if he could tell me anything about it, and I cannot do better than quote his letter:—"I am sorry," he says, "that I cannot say with certainty what really is the food-plant of *Phædon concinnum*. I find them all along the Solway for about ten miles, and I always find them on the fine, short, green pastoral grass, peculiar to the salt-marsh; in short there are no other plants about, except here and there patches of the sea-pink. As a rule, I never find them beyond the range of the salt water." Mr. Lennon goes on to say that although he has kept them alive with a sod of this grass for four months he has never noticed them feeding. The evidence as to its food-plant is therefore entirely negative.

A good deal more might perhaps be said on this group, but I hope that what has been said may help to simplify matters, and not make a confusion, which is as great as any I have ever come across in entomological nomenclature,—a "confusion worse confounded." I am quite aware that much I have said may be open to criticism, and shall be only too glad if any one else will throw a little more light upon the subject.

Lincoln, November 16, 1881.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Colias Edusa at Maldon.—On September 26th I caught a fresh female *Colias Edusa*, which was flying very weakly about 3 o'clock in the afternoon, a few minutes only after a very heavy storm. I kept it alive until October 4th, but it proved infertile. This is only the second specimen I have seen since December, 1877; the other was a worn female, found on exactly the same date as this in 1879.—EDWARD A. FITCH.

COLIAS HYALE.—Not having seen any record in the 'Entomologist' of the capture of the above species this season, I thought perhaps I should be pardoned sending you the information that I took a fresh specimen while staying at Deal in August last, on one of the slopes at Kingsdown, on the morning of the 18th of that month. This was the only one that I saw. I did not see *Colias Edusa* during the time that I was there, neither did I hear from other entomologists of it having been seen.—J. R. WELLMAN; 319, Elm Park, Brixton Rise, S.W., October 25, 1881.

ON THE SUPPOSED EXTINCTION OF VANESSA C-ALBUM.—Allow me to say a few words in reply to an article under the above title by Mrs. E. S. Hutchinson, which appeared in the November 'Entomologist' (Entom. xiv. 250). The text taken is a statement of mine (Entom. xiv. 210), which runs as follows: "*Vanessa C-album* is undoubtedly becoming scarcer in Great Britain, and is perhaps on the road to utter extinction." Now at the outset, as the above title shows, your correspondent has signally failed to comprehend the meaning of my statement. I never said, or supposed, that *V. C-album* had become extinct; what I did say was, "that it is becoming scarcer, and perhaps will become extinct." The writer should have written, "On the *probable* extinction of *V. C-album*," and would then have been strictly accurate. Mrs. Hutchinson then goes on to tell of the extraordinary abundance this year of the insect; and what I want to point out is that, by her own showing, this abundance is extraordinary and not normal, and is probably to be classed with those periodical seasons of abundance which more or less affect most species. The lady then warns us not to expect many *V. C-album* next year, and in this I think her correct. It is well known that from numbers of former localities the insect has now entirely disappeared, and I think I may safely say that an equivalent number of new ones has not been discovered. It is from these considerations that the observation that "*Vanessa C-album* is undoubtedly becoming scarcer in Great Britain, and is perhaps on the road to utter extinction," seems to me of the nature of a self-evident proposition. The very fact of Mrs. Hutchinson's failure to introduce it into other, and presumably appropriate, districts, is of itself significant to the evolutionist. I think had *V. urticæ* been tried the result would have been different. Mrs. Hutchinson then utters a protest against confusing that which has never been confused, enquires into the extent of my familiarity with the earlier stages of *V. C-album*, compares those stages with the corresponding ones in *V. Polychloros* and *V. urticæ*, and asks—"How can anyone seriously propose that these three spring from one stock?" In reply let me say this is not the place for a general discussion of the theory of evolution, and refer Mrs. Hutchinson to the works of Darwin, Fritz Müller, and others, where perhaps she will find the question answered to her satisfaction. If Mrs. Hutchinson will look up Stainton's 'Manual' she will see the genus *Grapta* characterised by the "indentations of the wings," and not by the larva. My series of *V. C-album* is none too long; I will therefore with pleasure avail myself of Mrs. Hutchinson's liberality.—G. COVERDALE; 2, Cannon Street, City, November 5, 1881.

PROBABLE EXTERMINATION OF HESPERIA ACTÆON AT LULWORTH.—Referring to the note by Mr. M'Rae, of Bournemouth, on this subject (Entom. xiv. 252), let me say that, whilst staying at Bournemouth this summer, I determined to visit Lulworth in search of *H. Actæon*, even if I had to make a long tramp from the nearest railway-station, but I was much delighted to see there was a boat-excursion every Friday to Lulworth and Weymouth. Consequently August 5th saw me "*en route*." I had the pleasure, during the four hours' stay, of taking one dozen specimens, but was informed that the species was much more plentiful the week before. During the day I met several collectors, who, like myself, had come for the first time to Lulworth, and not one had taken more than twenty specimens; whilst, on meeting Mr. M'Rae, he showed me about fifty specimens in his box. Now I think the answer to the above query is to some extent found in the fact that residents near a special locality like Lulworth, perhaps unwittingly, do considerable damage, even more than occasional "trippers," as mentioned by Mr. M'Rae. In consequence of the great demand on them for local species, collectors who reside near such a locality year after year visit the same place, and advertise the species for exchange, so contributing to this probable extermination.—ARTHUR J. ROSE; Mutlah Lodge, College Avenue, Hackney, November 4, 1881.

SPHINX CONVOLVULI AT NORWICH.—On September 22nd I captured a specimen of *Sphinx convolvuli* at rest on the rails of the Wellington statue in the market-place, evidently attracted by the electric light. On the same afternoon Mr. P. E. Dyball took one from the electric lamp. On September 24th another was picked up on the ground under the electric light, and given to Mr. Dyball. On September 30th a friend of Mr. Dyball's, named Dodd, captured one on the back river.—H. J. THOULESS; Lower Close, Norwich, October 5, 1881.

ENNOMOS AUTUMNARIA.—After the announcement from M. Wailly of his having sent out a great number of foreign eggs of *Ennomos autumnaria*, all interested in pure British Entomology should endeavour to carefully examine, and, if possible, guard against introducing any doubtful specimens into their cabinets; and as my name is connected with the Deal examples, I should like to place on record faithfully all I know about them. From 1877 I have each year spent a month or five weeks entomologising at Deal. In the autumn of 1878, after having several times met Mr. R. Harbour collecting on the sand-hills, I went to look at his collection. In it I found he had several very good species that he had mixed up with other species, for although an ardent worker he was not well up in obscure forms. Amongst his "thorns," under *Ennomos angularia*, was a female *E. autumnaria*, worn, tips of wing broken, but still unmistakably *autumnaria*. He had also two or three male specimens, more or less imperfect, that struck me as different to our London type of *angularia*; still I was not convinced that they were anything else than strongly-marked *angularia*. The female I then and there placed for him under its proper name, and advised him to keep a sharp look out on the gas lamps for more; this was in 1878. Two years after, in July, 1880, Mr. Harbour showed me his breeding-cage, in which at the time were one or two imagines of *E. tiliaria* just out of pupa, some spun-up pupa, and also two, or possibly more, long *Ennomos* larvæ. Not knowing them, I asked what they were. He told me they were *E. angularia*. As I had never bred that species I was desirous of doing so, to get varieties of this variable species; so asked him if he bred these and got eggs to spare to send me some. This, some three months later, he did in October, 1879, sending me thirty-six eggs, saying, "Enclosed you will find a few eggs of *angularia;*" and as such I entered them in my note-book. These eggs hatched during April and May of the present year, and, as previously reported, to my great pleasure and surprise they proved to be *E. autumnaria.* I had no suspicion that they were other than they had been represented, and left them in charge of my son whilst I was away at Deal. Had I thought them so valuable a thing as they ultimately proved, I should most certainly have had them under my own care, as larva-feeding is distasteful to my son, and he takes no interest in them. When I left home on June 27th, looking at them as *angularia,* I thought the largest of them were full-fed. I was much surprised at my son's report for next fortnight that none had yet pupated, but that they were still feeding and growing. I must say this roused my suspicion that they must be some other species, and I mentioned to Mr. Harbour that I could not understand them. The mystery was cleared up on my reaching home on July 26th, when I found the first male out. Some of the larvæ were then feeding, and continued to do so until August 12th. My first work was to write Mr. Harbour, telling him of the mistake he had made in the species. Naturally he is vexed with himself thus to have passed over this rarity, still he is now fully alive to the nature of a species he has for years passed over as the common *angularia.* I have had the pleasure of sending him a fine batch of fertile eggs, with which, and his more recent captures, he should be able to supply every cabinet in England with, I believe, genuine British *Ennomos autumnaria.* It is clear Mr. Harbour has for some years past been taking *E. autumnaria* sparingly at Deal, under the impression that they were only *E. angularia,* although it is curious that he could possibly have passed over so striking a species, even after having bred it from the eggs of a female taken at a gas-lamp in the autumn of 1879. For myself I may state that I neither saw the parent moth nor their offspring, until I bred them this year. That I did not recognise the larva when I saw it feeding at Mr. Harbour's is easily understood. I have never seen it before, and certainly it did not agree with the only description I knew, *viz.* Newman's. Mr. Harbour's captures, dating back so long, cannot be affected by M. Wailly's eggs.—W. H. TUGWELL; Greenwich.

Eupithecia ultimaria, *Dup.*—The history of this species is as follows:—It was captured near here by Mr. S. Stevens some twenty or twenty-five years ago, in the middle of September, and specimens forwarded to Guenée by Mr. Doubleday were returned to him as the *Eupithecia ultimaria* of Duponchel, with a query attached. Since then nothing has been done to establish its identity; and Mr. Stevens, I believe, has not taken it since. Mr. Bond has specimens taken on the downs in the Isle of Wight many years since. In the locality where the specimens were taken there are, within a radius of half a mile, some five or six stunted junipers, and I diligently worked these during the spring months, beginning in April, for *E. sobrinata* without success. I have also wasted two evenings watching these bushes, both at sunset, dusk and by lanterns, whilst these pugs were out, but have not seen a single specimen of *E. sobrinata* there. We do not at present know more of its life-history, though I fancy it will turn out a *Pimpinella* feeder. I have seen one or two specimens in other collections mixed with *Eupithecia sobrinata* or *E. subumbrata*.—Sydney Webb; 3, Luther Terrace, Dover. (See p. 303.)

Dasycampa rubiginea.—This species was taken by me on the 15th inst. I found it enjoying itself on the ivy-bloom in my garden, in company with *Phlogophora meticulosa*, *Plusia gamma*, &c. It may also be interesting to the readers of the 'Entomologist' that I obtained a fine specimen of *Acherontia Atropos*, which had found its way into a cottage near here on the 23rd of September. In reply to "Notes from Bournemouth," *Xylophasia polyodon* and *P. meticulosa* have been very abundant, and *P. gamma* considerably less in number, in this neighbourhood.—S. Norman; Dartmouth Castle, South Devon, November, 1881.

Vespa norvegica = britannica in Sussex.—On August 27th I found a nest of the tree wasp (*Vespa britannica*) hanging on a fir tree (*Cedrus deodara*). It is about the size of an ostrich egg, and was hanging about five feet from the ground. Is not this species of very rare occurrence in this part of England?—Thomas Howe; Normanhurst Court, Battle, September 18, 1881.

["This species is rare in the South and West of England; it is not uncommon in Yorkshire, and is frequently found building in gardens in gooseberry bushes; it also builds in fir trees. In Scotland it is abundant; I have also received it several times from

Ireland. Examples which I have seen from Northern Europe are much more highly coloured than British specimens." (Smith's Cat. Brit. Foss. Hym., 1858, p. 221.) For economy, see 'Zoologist,' x. 3699; 1852. In Dr. E. L. Ormerod's 'British Social Wasps' we read that this wasp is very local; but that in Gloucestershire, whence Dr. Ormerod wrote, this was the most common species of tree-wasp: "In the hot summer of 1864, when wasps were everywhere, *V. britannica* built freely in the neighbourhood of Brighton, to the astonishment of the natives of these parts" (p. 217). For figures of its nest see plates v.(?), xi., xiii. and xiv. Mr. Bridgman records it but once from Norfolk,—a nest taken at Witton, in 1875, by the Rev. J. L. Brown (Trans. Norf. and Norwich Nat. Soc. ii. 627); and the name does not occur in the 'Natural History of Hastings, St. Leonards, and the Vicinity'; 1878. Mr. Howe's specimens are particularly dark.—E. A. F.]

OBITUARY.

John Bickerton Blackburn.—Mr. J. B. Blackburn was born in 1845; the son of Mr. Samuel Blackburn, a Liverpool merchant. He passed his boyhood in Cheshire, where, in conjunction with his brother the Rev. Thomas Blackburn and the Rev. Martin Geldart, he edited the 'Weekly Entomologist,' which for a time succeeded the 'Intelligencer,' and occupied its place until 1864, when the 'Entomologist' was again published in independence of the 'Zoologist.' Its contemporary, the 'Entomologist's Monthly Magazine,' also appeared about the same time. Soon after that period Mr. J. B. Blackburn came up to London, and entered the Civil Service, in the Secretary's office of the Inland Revenue, from which he was obliged to retire from ill health about four years ago. During the long holidays enjoyed by Civil servants he devoted his time chiefly to collecting Lepidoptera, and made many visits to Rannoch. It was there, on August 14th, 1867, when with the Rev. Chas. J. Buckmaster, he made the remarkable capture of three specimens of *Sterrha sacraria.* A few years ago he matriculated at the London University, and eventually took the degree of B.A. Over-work at this period probably brought on the cerebral disorder which at last proved fatal. After spending another spring and summer again in Scotland he partially recovered, and began to read for Holy Orders; but his recovery was only partial, and prevented the realisation of his hopes. Mr. J. B. Blackburn's name was well known to entomologists over a long period as an earnest collector of insects, and as one who with ever-ready kindness of heart made many friends. Amongst his best captures was a *Phycis* taken near Freshwater, while again in the company of Mr. Buckmaster. This was afterwards added to our fauna as *Phycis oblitella* of Zeller. After much suffering he died on October 29th last, at the house of his father-in-law, the Rev. John Buckmaster, vicar of Wandsworth, much lamented by the many friends who knew him as a bright and pleasant companion, before he was affected by the insidious disease which ended in his death.—J. T. C.

WILLIAM GARNEYS.—Although a name less well known than that of Mr. Blackburn, we have equally to lament the death of Mr. Garneys, which occurred on the 21st of October last. His loss is peculiarly felt in the Midland Counties, where he was well known for his good general knowledge of Natural History, and his ever-ready willingness to impart his knowledge to others with that geniality and kindness which characterised his whole life. His attention was given especially to Botany, Conchology, and Entomology, the order Coleoptera receiving his chief care. A few months before his decease he edited a new edition of the 'Fauna and Flora of Repton,' contributing a list of Coleoptera found between the rivers Dove and Derwent. Mr. Garneys, descended from a very old Suffolk family, was born at Bungay in 1831; he adopted the medical profession. His father, also a medical man, is still living, and it was from him his son inherited the taste for Natural History, fostered in his youth by intercourse with the Norwich naturalists of that time. About twenty years ago he joined the late Mr. Chas. Newgill, of Repton, in medical practice, who also was in his day well known as a botanist and entomologist. Notwithstanding a large country practice and the medical care of an important public school, Mr. Garneys always found time for his favourite study, even to the day of his death, which was caused by apoplexy. He leaves a widow and six children to mourn with his many friends the loss of a good friend, and quiet, but earnest, worker in Science.—J. T. C.

DESCRIPTION OF PLATE.

By John T. Carrington, F.L.S.

The plate now presented to the readers of the 'Entomologist' is intended to represent only those species and certain varieties of Lepidoptera which have been recently captured in Great Britain. The following is a description of the twenty-two examples figured. The first seven are those of the genus *Eupithecia* :—

Fig 1. Was captured in the Hebrides with three others of the same form, during the past summer, by Mr. Meek's collector. A description of this and the two following will be given in an early number of the 'Entomologist,' as the specimens have gone to the Continent for comparison with nearly allied European species.

Figs. 2 & 3. Were taken by Mr. H. M'Arthur in the Shetland Isles. They may be melanic varieties of *E. satyrata* or *E. nanata*. These, as in figure 1, will receive future consideration.

Figs. 4 & 5. *Eupithecia jasioniata*, Crewe. Fig. 4 from larvæ found in North Devon, as recorded, Entom. xiv. 198, by Mr. R. Ficklin. Fig. 5 was bred from larvæ taken near Valentia, Ireland (Entom. xiv. 212).

Figs. 6 & 7. If not new to science are the *Eupithecia ultimaria* of Dup. On page 300 in this number will be found some notes from Mr. Sydney Webb, who took on the Kentish Downs the examples figured.

Figs. 8 & 9. Male and female (enlarged) of *Scoparia conspicualis*, Hodgk., taken in North Lancashire (Entom. xiv., 223), by Mr. Hodgkinson.

Fig. 10. *Catoptria decolorana*, Frr. (enlarged). This species, which feeds upon the seeds of golden-rod (*Solidago virgaurea*) in dry woods, was known as *C. æmulana* until assigned its correct name (Entom. xii. 130). Though closely allied to *C. æmulana*, it may be easily recognised by its smaller size, shorter wings, and the more "powdery" appearance of the colours.

Fig. 11. *Catoptria æmulana*, Schl.=*modestana*, H.-S.=*tripoliana*, Barrett. Has also long been known as frequenting salt-marshes in this country, where it feeds in the seed heads of *Aster tripolium*. This species was recently redescribed by its latter synonym (E. M. M. xvii. 84).

Figs. 12, 13, 14. *Boarmia repandata*, two extreme forms. Figs. 12 and 13 are of *B. repandata* var. *Sodorensium*, Weir, as described Entom. xiv. p. 220, from the Hebrides; while the other (fig. 14) is a very striking example of the var. *conversaria*, Hub., of the same species, taken by Mr. South in North Devon during the past season.

Fig. 15. A *Dicrorampha* (enlarged), as yet undescribed, also taken by Mr. South in North Devon.

Fig. 16. *Stigmonota scopariana*, H.-S. (enlarged). Added to the British fauna by Mr. Hodgkinson last season (Entom. xiii. 162).

Fig. 17. *Emmelesia albulata*, var. *Hebudium*, Weir (Entom. xiv. 221), from the Hebrides last season.

Fig. 18. *Bryophila par.*—Added last season to the British list by Mr. Wm. Warren (Entom. xiii. 225).

Fig. 19. A new British *Pterophorus*, probably *P. nemoralis* of Zeller. Also captured in North Devon by Mr. South.

Fig. 20. A very beautiful variety of *Melanippe montanata*, taken this summer by the Rev. H. T. Hutchinson, near Longleet, Wilts.

Fig. 21. *Pyralis Lienigialis*, Zell.—Added to our fauna by Mr. Thompson (Entom. xiv. 84), taken near Stony Stratford.

Fig. 22. *Tortrix Lafauryana*, Ragonot. Captured near King's Lynn, and added to the British list by Mr. E. A. Atmore, in July, 1881. (Entom. xiv. 153.)

We have to thank the various gentlemen by whom the specimens figured have been kindly lent.

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EDITED BY JOHN T. CARRINGTON, F.L.S.

WITH THE ASSISTANCE OF

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> "By mutual confidence and mutual aid
> Great deeds are done and great discoveries made."
> POPE'S '*Homer.*'

VOLUME THE FIFTEENTH.

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3 plates –

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"When simple curiosity passes into the love of knowledge as such, and the gratification of the æsthetic sense of the beauty of completeness and accuracy seems more desirable than the easy indolence of ignorance; when the finding out of the causes of things becomes a source of joy, and he is counted happy who is successful in the search; common knowledge of Nature passes into what our forefathers called Natural History, from whence there is but a step to that which used to be termed Natural Philosophy, and now passes by the name of Physical Science."

THOMAS HENRY HUXLEY, *in "The Crayfish."*

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NOTES ON THE LEPIDOPTERA OF THE ORKNEY ISLANDS.

By J. Jenner Weir, F.L.S., F.Z.S.

The Orkney Islands lie between 58° 41′ and 59° 23′ N. lat., and between about 2° and 3° W. long., thus being from 7° to 8° north of London; still the climate is mild. The average temperature of February, the coldest month, is 38°, and of July, the hottest month, 55° 14′. The rain-fall during the year averages about 36¾ inches. These islands are separated from the north-east of Scotland by the Pentland Firth, which, at the narrowest part, is not more than 5½ miles in width. The whole group, with the exception of a small granitic district, near Stromness, consists of rocks belonging to the old red sandstone formation; thus their geological structure differs essentially from that of either the Shetlands or Outer Hebrides.

Through the kindness of Mr. Meek I have been enabled to examine a collection of Lepidoptera made in the Islands during four months of the past season, which are in the possession of Mr. Clarence E. Fry, through whose instrumentality they were collected. As might be expected, from the near proximity of the Islands to the North of Scotland, the insects do not in most cases differ materially from those found on the mainland; yet the collection is most interesting, presenting in many of the species differences in colour from that which obtains either in the Shetlands or Outer Hebrides.

The following is a list of the Lepidoptera taken in the Island of Hoy, about eight miles distant from the coast of Caithness, and in which island alone were any insects collected:—

**Pieris brassicæ*
**Chortobius Davus*
**Lycæna Icarus*
Acherontia Atropos

Hepialus lupulinus
*_H. humuli_
*_Chelonia plantaginis_
Scodiona belgiaria
Fidonia atomaria
Oporabia filigrammaria
*_Larentia didymata_
L. cæsiata
L. salicata
L. pectinitaria
*_Emmelesia albulata_
E. ericetata
E. blandiata
*_Eupithecia venosata_
E. satyrata
E. nanata
E. sobrinata
E. pumilata
Thera simulata
Ypsipetes ruberata
*_Y. elutata_
Melanthia ocellata
M. sociata
*_M. montanata_
Coremia munitata
Cidaria miata
*_C. russata_
*_C. immanata_
*_C. testata_
C. populata
C. fulvata
Carsia imbutata
Anaitis plagiata
Hydrœcia nictitans
H. micacea
Xylophasia rurea and var. _combusta_
X. polyodon
Mamestra furva
Apamea basilinea
A. gemina
A. oculea
Miana furuncula
Celæna Haworthii
Caradrina cubicularis
Agrotis suffusa
A. porphyrea
A. pyrophila (melanic var.)
*_Triphæna orbona_
T. pronuba
Noctua glareosa
N. augur
N. C-nigrum
*_N. festiva_ and var. _conflua_
*_N. Dahlii_
*_N. rubi_
N. neglecta
*_N. xanthographa_
Tæniocampa gothica
Xanthia ferruginea
*_Epunda lutulenta_ (var. _Luneburgensis_)
E. viminalis
Euplexia occulta
Hadena adusta
H. glauca
H. dentina
H. thalassina
Calocampa vetusta
C. exoleta
Plusia gamma
Stilbia anomala
Herbula cespitalis
Scopula lutealis
S. prunalis
Stenopteryx hybridalis
Scoparia atomalis
S. alpina
Crambus pratellus
C. culmellus
Peronea Caledoniana
P. variegana
P. Hastiana
Teras caudana
T. contaminana
Dictyopteryx Lœflingiana

Penthina marginana
Sericoris littoralis
Mixodia Schulziana
Cnephasia musculana
Clepsis rusticana
Bactra lanceolana
Phoxopteryx unguicana
P. myrtillana
Grapholita campopoliliana
G. Penkleriana
Phæodes tetraquetrana
Hypermecia cruciana
Pædisca Solandriana
P. sordidana.
Ephippiphora Pflugiana
Pamplusia mercuriana
Catoptria ulicetana
Xylopoda Fabriciana
Eupœcilia angustana
E. ciliella
Argyrolepia Baumanniana
A. cnicana
Aphelia osseana

In this list none but those marked with an asterisk call for any remark; the coloration of the others is similar to that of the ordinary Scottish type.

Pieris brassicæ.—It is doubtful whether this species is indigenous; it has probably been introduced with the cultivated *Brassicaceæ.*

Chortobius Davus.—The Orcadian specimens resemble in colour those from Rannoch.

Lycæna Icarus.—The specimens are large, measuring as much as 1 inch 5 lines; an unexpected fact.

Hepialus humuli.—It is noteworthy that none of the specimens taken approach in the slightest degree the coloration of the variety *Hethlandica*, but all are quite of the ordinary normal type.

Chelonia plantaginis.—Here, as in the Shetland examples of this species, the colour of the upper wing is of a very light straw-colour in some specimens.

Larentia didymata.—The females of those taken are of an unusually light colour.

Emmelesia albulata.—This insect which, both in the Shetlands and Hebrides, varies so much from the normal type that I have deemed those from each group of islands worthy of a subspecific name, appears in the Orkneys of the usual colour.

Eupithecia venosata.—The leaden grey ground colour of this insect, as found in Shetland, does not appear to extend to those taken in the Orkneys.

Ypsipetes elutata.—The specimens are very variable; some extreme aberrations have the ground colour of the wings black, with very decided red bars.

Melanippe montanata.—Those taken are of the normal colour, except one very light variety; but none approach the variety *Shetlandica*.

Cidaria russata.—This variable insect, which is so uniform in colour in the Hebrides, is in the Orkneys very variable; two specimens present the extreme aberration of a yellow ground colour to the upper wings, with black lines.

Cidaria immanata.—The Orcadian closely approach in colour to the Shetlandic.

It may be here remarked that in the Shetlands it appears *C. immanata* is found, and not the closely-allied *C. russata*; in the Hebrides the reverse is the case, but in the Orkneys both species are found; indeed all the evidence shows that the latter islands are barely insular in their Lepidoptera.

Cidaria testata.—The specimens are of a dark purplish lead-colour in their markings, and, like those from Shetland, are devoid of yellow. I believe that this dark form of the insect may be often found farther south, as I find one in my collection labelled as taken by myself in the New Forest.

Triphæna orbona.—Only one specimen taken, and that of the form known as *Curtisii*.

Noctua festiva, *N. Dahlii*, and *N. rubi.*—These three species, taken in the Orkneys, resemble each other very closely, and it requires a careful examination to separate them; the prevailing colour in each species is ruddy brown. The same remark applies, but in a less degree, to *N. xanthographa*.

Epunda lutulenta var. *Luneburgensis.*—This is a very interesting capture; several specimens taken agree well with the description given by Staudinger in his 'Catalogue of European Lepidoptera,' No. 1341, p. 95. He writes as follows:—"Nigricans, fasciis distinctis albis." The habitat given is South-western Germany; ? Pyrenees.

The subject of the entomological fauna of the more remote British Isles is a new field of investigation, and promises to yield good results to those who engage in it. At present we know, and probably only partially, the Lepidoptera found in one of the Shetlands, Mainland; one of the Orkneys, Hoy; one of the Outer Hebrides, Lewis; and very little of any other islands of the three groups.

There can be no doubt that the Færöe Isles, although politically belonging to Denmark, as the Shetlands and Orkneys did until after the middle of the 15th century, are geographically a portion of the British Islands. The Shetland Islands lie halfway between Norway and the Færöes, and I am quite of opinion that the Lepidoptera of the Færöes should appear in our cabinets in a collection strictly of the indigenous Lepidoptera of the British Isles, viewed geographically; precisely as, for the converse reason, I should exclude the insects of the Channel Islands and Heligoland, which geographically belong to France and Germany respectively, but politically to England.

To my mind the inclusion of the Shetlands and Orkneys in the British Isles for entomological purposes, simply because they were mortgaged in 1469 to James III. of Scotland by the king of Denmark and not redeemed, and the exclusion of the Færöe Isles only because they still remain a part of the dominion of the king of Denmark, is absurd. It would indeed be a novelty to deal with the geographical distribution of animals on a political basis.

6, Haddo Villas, Blackheath, London, S.E., November, 1881.

NOTES ON THE LEPIDOPTERA OF NATAL.

By A. J. Spiller.

I should have replied to Mr. Gooch's criticisms respecting my article on the "Rhopalocera of Natal" before this, but observing that a series of papers from his pen on the Lepidoptera of that colony was appearing in the 'Entomologist,' I awaited their conclusion before so doing. I find no fault whatever with Mr. Gooch for thus criticising my article, but at the same time I claim my right to reply to certain misleading statements.

Mr. Gooch too hastily assumes that I intended my article to be exhaustive of Natal Rhopalocera, and expresses regret that I did not communicate with Mr. Trimen in order that it might be more complete. But my object in writing was principally to inform collectors at home of the species that had actually come under my notice during the comparatively short time of my residence here; consequently I do not write about species that were supposed to occur elsewhere, but which had not, up to this time, come under my own personal observation.

Mr. Gooch also objects to my statement that I had captured several new species. I am fully aware that Mr. Gooch had personal acquaintance with the Lepidoptera of this colony for five years, and during that time had only met with one new species of butterfly, *Neptis Goochii;* and therefore it was quite natural that he should have regarded my statement with a certain amount of doubt; but, nevertheless, the fact remains that I have taken some half a dozen species utterly unknown to Colonel Bowker or any Natal entomologist, and which are not included in Trimen's list. It must be remembered that the whole European population of Natal amounts to only 20,000, and that amongst such a sparse population entomologists would be few and far between. With the exception of Colonel Bowker and myself, and two or three "butterfly-catchers," there are at present no other entomologists in the colony; consequently it is not surprising I should meet with species not yet taken by other collectors. I may instance a lovely canary-coloured *Pieris*, which I met with frequently in the woods on the Zululand border, and from the occurrence in the same place of many rare species, such as *Amauris Dominicanus*, *Pieris Saba*, *Eronia Argyia*, *E. Buquetii*, *Anthocharis Antigone*, &c., I infer that there they reach about their southernmost limit.

Mr. Gooch refers to a butterfly as stated to be found at the Inanda Hills, and which he believes to be a "myth." His informant, Mr. Macken, was shown this butterfly by the same resident at the Inanda (Mr. Wood), who mentioned the circumstance to me. I therefore went in search of it, and found it to be a splendid large butterfly, although not so "gigantic" as Mr. Gooch was informed. In 1879 I met with a few, but this past April I hunted it well in its very limited locality, and returned with a splendid long series. It expands about three or four inches, and has been named *Debis Indosa*.

Respecting the moths of Natal I found the best way to secure numbers was by light. After the spring rains I generally begin, for with the renewal of vegetation appear vast numbers of insects. My house is situated in the "bush," or rather it has about twenty acres of bushland surrounding it. Several large lamps are placed on a table by a window, the room is cleared of furniture, the windows thrown up, and the lamps left burning until daybreak. When I began this plan of capturing insects I was simply in a state of delightful bewilderment. It would be an impossible task to name the species, as no one in Natal knows the name of our small moths; but amongst the thousand species of moths I have secured are innumerable tigers, leopards, satins, *Saturnias*, *Drepanulæ*, buff and chocolate tips, *Notodontas*, a pretty *Epione* resembling *Vespertaria*, thorns, waves, *Boarmias*, *Eupithecias*, carpets, and *Noctuæ* galore. After a favourable night's work the room presented a strange appearance: some hundreds of moths would be sticking about on the walls, ceiling, and windows; whilst beetles and Orthoptera would be in almost equal plenty. The largest species of moths would expand about six inches, but these species are best obtained by breeding. *Actias Mimosa*, a lovely apple-green moth, is easily found in the chrysalis state in December on branches; they emerge in January, but a few remain over until September. Many other large species, expanding from four to six inches, are found in the larval state on *Mimosa*, cabbage and Kafir boom-trees, and are as attractive to the natives as to entomologists, since I found my Kafir servants were in the habit of appropriating these larvæ from the breeding-cages for the purpose of eating them.

Mr. Gooch also hastily assumes that my "big bush," near the coast, is the one in which he was in the habit of collecting, *viz*. at Avoca, eight miles from Durban. I should be more than surprised to hear of the occurrence of leopards in that district, since it is comparatively thickly populated with Kafirs and Coolies. In the large woods on the coast, going towards Zululand, they occur; and also at the Inanda, where my friend Mr. Wood, a great botanist, has just poisoned an extraordinarily large one, which was in the habit of prowling round his domicile by night.

Mr. Gooch also assumes that I have passed over *Pseudacræa Boisduvalii* and *Tarquinia* for *Acræa Zetes* and *Aganice* respectively. The omission of these from my paper was purely accidental, as they are by no means uncommon on this part of the coast. *P. Boisduvalii* is certainly very like *A. Zetes* on the wing; but I cannot agree with Mr. Gooch that it is impossible to distinguish them apart. Certainly I never had the least difficulty. *P. Boisduvalii* is not only the larger, but is far the brighter coloured; and its flight is not exactly like *A. Zetes*, being an easy floating movement, unless struck at and missed, when it goes off with the speed of a *Charaxes*. *P. Boisduvalii* was very common during the first half of this year, although it is sometimes a very scarce insect. Colonel Bowker informs me that until this season he had only met with four specimens in thirty years.

It is not my intention to refer to the Natal butterflies in detail, but whilst I have pen in hand I may mention a few incidents that may be interesting to entomologists at home.

The early part of the present year (1881) was very prolific in the genus *Charaxes*, since I met with nine different species of this genus. Two of them, *Charaxes Saturnus* and *C. Druceanus*, are of very rare occurrence in this part of Africa; they are both exceedingly handsome insects, the former being bright red-brown, the latter dark red-brown. Another species, generally rare, appeared in considerable plenty, viz. *C. Candiope*, already referred to by Mr. Gooch. I captured about fifty specimens of this large and handsome species, and about the same number of the Natal variety of *C. Xiphares* (*C. Cithæron*). These species were taken by supplementing the exudations from gum-acacias and *Mimosas* with a strong decoction of "sugar." They were taken at various places along the coast, so I imagine their abundance during the past season to have been general; and as late as July I found them flying in woods on the Zululand border. *C. Brutus* was even commoner than the two species just mentioned, as a glance at the long rows in my boxes informs me.

It is very interesting to observe the different "forms" species assume in this country through variations of temperature and other causes. *Papilio Pylades* but rarely appears in the winter, but I captured a solitary specimen during my July trip to the Zulu border that differed very considerably from the ordinary summer forms. The rare *Lachnoptera Agresii*, which occurs at the Inanda and on the Zulu border, possesses certain distinctive marks of difference, the Inanda specimens being brighter than the two individuals taken in the latter locality. I cannot agree with Mr. Gooch in thinking that this insect is commoner than it seems, for in my anxiety to obtain a fine cabinet series I have not passed many *Atella Phalanta* without most carefully noting them.

I certainly do agree with Mr. Gooch in thinking that *Diadema dubia*, *mima* and *Anthedon* are plastic forms of one species, but at the same time the forms are common to both male and female: thus I have taken male *Anthedon* in copulation with female *Mima*, and *vice versâ*. *Eurytela Hiarbas* and *E. Dryope* are, I believe, also varieties of the same species, since I have taken them in cop.; and on the Zulu border, last July, I caught an intermediate variety, the individual being a male, with the markings of *E. Hiarbas*, but the white stripe was replaced by one of dark red-brown, much darker than the usual orange band of *E. Dryope*. As I have also taken *C. Zoolina* and *C. Neanthes* in cop., as well as *J. Archesia* and *J. Pelasgis*, I am inclined to imagine they are likewise varieties of each other. I am, however, quite aware that it is by no means an infallible test of the identity of a species to find two distinct forms in cop., since amongst the orange-tips such a phenomenon is frequently seen. The splendid "mother-of-pearl," too, is by no means very particular with whom it mates; I have taken it on terms of tender intimacy with *J. Archesia* and *P. Merope*, female; and Colonel Bowker assures me he has taken it in cop. with a large day-flying moth, *Aphelia Apollinaris*. Possibly this queer weakness accounts for the peculiar varieties of this butterfly that occasionally turn up: one, being a dark form, almost black; another, shining like polished silver; and another, with a beautifully embroidered border, has been dignified as a distinct species. This latter variety is very rare; I have only caught it on the Zulu border, and at the same time the woods were all alive with the ordinary form floating through the Kafir footpaths like large patches of polished silver.

Mr. Gooch has referred to two skippers, *Leucochitonea bicolor* and *L. paradisea*, as two butterflies so local that they are confined to a single locality; but I think they will be found in various suitable localities when the colony is more worked. *L. bicolor* I have found at the Inanda Hills; it is certainly not plentiful; but at the same place *L. paradisea* occurs in plenty. Mr. Wood takes it plentifully even in his garden in April. It also occurs at Verulam, where I have taken it in my own garden and grounds; and I have even caught individuals close to Durban. The night-flying skippers, *Pamphila Erinnys*, *P. Fiara* and *P. Dysmephila* are also considered rare; but this is, I believe, entirely owing to their nocturnal habits. *P. Dysmephila* feeds on the date palm, and the larva changes to a pupa enclosed in a cocoon amongst the date leaves. *P. Fiara* feeds on the wild banana palm; this latter species is easily distinguished from the other large skippers by its white antennæ. During last July, whilst exploring the upper part of the coastlands, I put up in a hut in the woods, and every evening during my stay I observed this species flying with great rapidity around the banana palms that abounded in the locality; I managed to secure a considerable number, and also a good supply of eggs, which were deposited singly on the leaves. One of the rarest of Natal skippers is *Caprona Pillaana*, of which species I secured three in 1880; but the most careful searching has revealed no others. Early in the present year an immense swarm of *Crenis Natalensis* (the black form) appeared, and, strange to say, migrated by thousands towards Zululand. In the woods they were in a perfect cloud. On every gum patch they formed a thick black mass, and when the net was placed over such a patch hundreds could be taken at once. The pupæ were to be taken in any number sticking on all kinds of leaves, twigs, &c. About the same time a vast plague of larvæ appeared in the sugar-fields, causing alarm, and filling the minds of the planters with ideas of bankruptcy. I pointed out to them that the larvæ were those of a Noctua, and would in a short time enter the ground, when possibly no such plague would occur again. In two or three weeks they went "down," and the sugar-fields recovered their wonted appearance. At the same time a plague of the larvæ of *Acherontia Atropos* appeared amongst the Kafir "sweet potatoes." Leading articles appeared in the colonial newspapers on these plagues, and a "special" representative of the 'Times of Natal' reported on *A. Atropos* larvæ as "worms about three inches long, amber-coloured, and with quarter-inch bones in their tails."

Verulam, Natal, October 10, 1881.

PS.—The number of species of Natal Rhopalocera captured by me from December, 1878, to October, 1881, amounts to 192.

INTRODUCTORY PAPERS ON *ICHNEUMONIDÆ.*

By John B. Bridgman and Edward A. Fitch.

No. II.—ICHNEUMONIDÆ (*continued*).

The *Ichneumones pneustici* have been tabulated by Wesmael as follows. Wesmael's fifth subfamily, the *Ichneumones heterogastri*, which contains but one genus (*Alomyia*), and Gravenhorst's genus *Microleptes* are also added here for convenience sake.

A. Wings with an areolet.
a. Spiracles of the 1st segment of the abdomen situated between the middle and the apex.
* Scutellum but slightly elevated.
† Middle of the apex of the metathorax not elongated beyond the base of the hinder coxæ.
‡ Mandibles bidentate; the upper tooth very stout, lower very short. - - Gen. 1. *Herpestomus*, Wesm.
‡‡ Mandibles with two teeth of almost equal length.
§ 2nd abdominal segment with no impression at the base.
× Mandibles of the female knobbed on the under border; flagellum of male filiform.
Gen. 2. *Colpognathus*, Wesm.
× × Mandibles of the female with an entire border on the under side.
o Post-scutellum with pits. - Gen. 3. *Dicœlotus*, Wesm.
oo Post-scutellum smooth; flagellum of male attenuated at the base. - - - Gen. 4. *Centeterus*, Wesm.
§§ 2nd abdominal segment more or less distinctly impressed at the base.
+ 2nd abdominal segment with two pits at the base.
Gen. 5. *Nematomicrus*, Wesm.
+ + 2nd abdominal segment with a transverse linear impression at the base.
++ Clypeus, apical margin smooth, or entirely abruptly depressed. - - Gen. 6. *Phæogenes*, Wesm.
++ ++ Apex of clypeus widely scolloped out in the centre.
Gen. 7. *Oiorhinus*, Wesm.
++ ++ ++ Clypeus, just before the apical margin, has a small pit in the middle. - - Gen. 8. *Æthecerus*, Wesm.

†† Apex of metathorax prolonged tail-like beyond the base of the hind coxæ. - Gen. 9. *Oronotus*, Wesm.

aa Scutellum very convex and prominent.

∞ Metathorax short, supero-medial area transverse linear, petiole rather long. - Gen. 10. *Ectopius*, Wesm.

∞∞ Metathorax not short, supero-medial area not transverse linear.

1st segment rather short.

o Apex of abdomen acute, aculeus of female quite straight. Gen. 11. *Ischnus*, Grav.

oo Apex of abdomen obtuse, aculeus of female curved upwards. - - Gen. 12. *Heterischnus*, Wesm.

b. Spiracles situated in the middle of the 1st segment. *Alomyia*, Panz.

B. Wings without an areolet. - - *Microleptes*, Grav.

These generic characters are not in all cases so precise as could be wished, many of the species having consequently been placed under more than one of the genera, as will be seen on reference to the synonymy in Marshall's Catalogue. Note especially the distribution of the ten species under *Ischnus* in Gravenhorst's 'Ichneumonologia Europæa.' Even the distinctive mark of the subfamily itself—the circular metathoracic spiracles—is shared by a few species which have already been noticed in the last subfamily in the genera *Platylabus* and *Apæleticus*.

Herpestomus, *Wesm.*

A. Post-petiole closely punctured.
Gastrocæli very distinct.
Black or brownish black, margins of segments piceous, antennæ dark; greater part of legs red. - 1. *brunnicornis*, 2½—3 lines.

B. Post-petiole smooth and shining.
Gastrocæli hardly visible.
Thorax with pale line before the wings, apex of scutellum white; abdomen more or less red, femora and tibiæ red; female, antennæ with a pale ring (sometimes obsolete); male, front coxæ pale, hind black. - - - - - 2. *facialis*, 2—2½ lines.

C. Post-petiole distinctly striated.
Thorax black; 2nd to 4th abdominal segments and legs red; apex of hind femora and tibiæ black. - - - *striatus*, 2⅔ lines.

Four Gravenhorstian species are partly referable to *H. facialis*. *H. striatus*, Bridgm., is a species new to science, both sexes of which have been taken at Norwich (Trans. Ent. Soc.

Lond., 1881, p. 145, pl. viii., figs. 1 & 2). *H. brunnicornis* is a common parasite of various species of *Hyponomeuta;* it is partly figured in Vollenhoven's 'Schetsen' (pt. i., pl. iii., fig. 12).

Colpognathus, *Wesm.*

Scutellum black, 2nd to 4th and 5th segments of the male, 1st to 4th of the female red; legs red; coxæ, trochanters, apex of hind femora, base and apex of hind tibiæ, black; antennæ of female tricoloured (variable in this respect). - - - 1. *celerator*, 3—4 lines.

This species is also figured in Vollenhoven's 'Schetsen' (pt. i., pl. iii., fig. 13). It is apparently uncommon in Britain, notwithstanding what Gravenhorst says. Brischke says it has been bred from *Bembecia hylæiformis*;* but Rondani gives *Botys nubilalis* (= *silacealis* = *lupulinalis*).

Dicœlotus, *Wesm.*

Antennæ of the female generally red or reddish at the base, the rest dark; the male has the basal joints pale beneath. Scutellum black.

A. Abdomen black; extreme apical margins of intermediate segments castaneous (females).
a. Legs fuscous-black; front femora and tibiæ straw-coloured beneath. 1. *pumilus*, 2—2½ lines.
b. Legs reddish yellow; hind coxæ black. - *Cameroni*, 2 lines.
B. Segments 2nd to 3rd or 4th red, most frequently with black dorsal marks (females).
a. Hind coxæ at least black, or at the base; legs red.
* Entire abdomen punctured; all the coxæ black. 3. *parvulus*, 2 lines.
** 1st segment smooth. - - - - - 5. *pusillator*, 2 lines.
b. Coxæ and legs red. - - - - 4. *rufilimbatus*, 2½ lines.
C. Ditto (males).
a. Front coxæ or trochanters white or yellow.
* Segments 2nd to 5th, apex and sides, red; 6th and 7th entirely red. 1. *pumilus*, 2½ lines.
** Segments 2nd to 4th red, mostly with dark dorsal marks; margin of 5th and 6th red. - . - - 2. *ruficoxatus*, 2 lines.
b. Front coxæ and trochanters black. - - 4. *rufilimbatus*, 2½ lines.
D. Segments 1st to 3rd red, 4th partly so, and generally the apical margin of the rest (female).
Legs red; femora partly brown; hind coxæ with a black spot. 2. *ruficoxatus*, 2½—2¾ lines.

The species of *Dicœlotus* are but little known in Britain, although *D. pumilus* is by no means rare. This species is figured by Vollenhoven in his 'Schetsen,' (pt. i., pl. iii., fig. 14). The closely-allied *D. Cameroni* is described in Trans. Ent. Soc.

Lond., 1881, p. 146, pl. viii., fig. 3; one female being taken at Norwich and another in Scotland by Mr. Cameron. Nees bred *D. pusillator* from *Cossus ligniperda* (teste Gravenhorst); and Rondani says it is parasitic on a species of *Notodonta*.

Centeterus, *Wesm.*

A. Antennæ of female tricoloured.
  Abdominal segments 1st to 4th in female, 2nd to 4th in male, and legs red; apex of hind femora, base and apex of hind tibiæ, black.
 a. Antennæ of female black at the base; coxæ, trochanters and thorax entirely black in the female; collar of male white in the middle.
  1. *major*, 3—4 lines.
 b. Antennæ of female at the base and upper part of the collar, sometimes the sides also, red; legs like *major*, only the male has the hind femora black. - - - - 3. *confector*, 2¾—3½ lines.
B. Antennæ between the base and middle, abdominal segments 2nd to 4th, and legs, red; apex of hind femora, or nearly all of it, base and apex of hind tibiæ, black (female).
  Segments 2nd to 4th red-edged, or red marked with black; legs red; all the coxæ, trochanters, hind femora, base and apex of hind tibiæ, black (male). - - 2. *opprimator*, 2½—3¼ lines.

Brischke gives the hosts of two species of *Centeterus*—*C. major* from *Bembecia hylæiformis** and *C. confector* from *Nonagria geminipuncta*. *C. opprimator* is badly figured in Vollenhoven's 'Schetsen' (pt. i., pl. iii., fig. 15). The species are not rare in Britain.

Nematomicrus, *Wesm.*

Extreme apical margin of abdominal segments reddish; orbits of eyes and a line before the wings yellow; legs red; hind coxæ and trochanters black; apex pale (male and female).
  1. *tenellus*, 2½ lines.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Notes on Irish Rhopalocera.—In reference to Dr. F. Buchanan White's very interesting paper on the "Distribution of British Butterflies" (Entom. xiv. 266), I think, as far as my information goes, he is mistaken when he includes *Vanessa C-album* in the Irish list. The insect is not mentioned either in the Rev. J. Greene's "List of Lepidoptera hitherto taken in Ireland" (Nat. Hist. Review, 1854, p. 165), or in my friend Mr. Birchall's "Catalogue of the Lepidoptera of Ireland," 1866; and the only observer, as far as I am aware, who has noticed it in

Ireland is the Rev. H. H. Crewe, by whom it was supposed to have been seen at Powerscourt, Co. Wicklow. *Argynnis Selene*, not included as Irish in Dr. White's list, has been taken at Edenderry, Queen's County, as mentioned by Mr. Birchall (Ent. Mo. Mag., vol. xiv., p. 211).—[Rev.] WILLIAM W. FLEMYNG; Portlaw, Co. Waterford, December 2, 1881.

ENTOMOLOGICAL NOTES FROM DOVER.—While collecting at Dover, in August, we found a great many butterflies out, and counted in all over twenty different species on the wing during that month; and this only on the cliffs east of the town. The locality was absolutely swarming with *Lycæna Corydon* and *L. Alexis*, and many good varieties of both were taken. *Polyommatus Phlæas* was common, but not in such profusion; and of *L. Alsus* we only captured two specimens; this might, however, be owing to the prevalence of windy weather. The freshly emerged imagines of *Vanessa Atalanta*, *V. Io*, and *V. cardui* were just beginning to put in an appearance, and on the 15th and 20th of August we took two males of *Colias Edusa* in a lucerne-field by the East Cliff. *C. Edusa* does not seem to be plentiful this season, as only those two were seen during our three weeks' stay. On the grassy slopes at the Zigzag Cliffs, near South Foreland Lighthouse, *Argynnis Aglaia* and *Satyrus Semele* were to be found, but both rather worn; we managed, however, to get two or three of the former in fair condition; and in the same locality we took *Hesperia Sylvanus*, *H. comma*, and *H. linea*, the first-named being the commonest of the three. With regard to moths, we did very little, being unable to do anything in the way of sugar or light; and only a few Geometræ and day-flying Noctuæ fell to our lot. *Fidonia atomaria* and *Aspilates gilvaria* were common among the grass and herbage on the cliffs, and *Bryophila perla* was rather plentiful, being found at rest in the early morning on walls, houses, &c., in the town; but of *B. glandifera* we saw nothing. Perhaps the most common of all was *Zygæna filipendulæ;* it was a usual occurrence to see three or four of them on a single flower-head of scabious or knapweed, and the cocoons abounded everywhere; some that we noticed were fixed to the chalk-cliffs somewhat in the manner of a *Pieris* chrysalis.—T. GOWLAND; Enfield Buildings, N., October 6, 1881.

LEPIDOPTERA IN THE ISLE OF PURBECK.—I am not aware that any list of the insects occurring in the Isle of Purbeck has been published, so that perhaps the following list of rare or local insects, taken by myself (without any attempt at systematic collecting) at different times in the island, may interest some of your readers:—*Lithosia quadra*, *Acidalia contiguaria*, *Macaria alternata*, *Camptogramma fluviata*, *Stauropus fagi*, *Triphæna subsequa*, and *Dasycampa rubiginea*, single specimens. *Lobophora sexalata*, *Xylina semibrunnea*, *X. petrificata*, and *Lycæna Adonis*, several specimens. *Lithosia stramineola*, *Emmelesia albulata*, *Anticlea rubidata*, *Agrotis saucia*, and *Xylina rhizolitha*, commonly. *Argynnis Aglaia*, *Arge Galathea*, and *Scodiona belgiaria*, are abundant on the range of chalk downs for, I believe, their whole length from Lulworth to Studland. *Charæas graminis* and the larvæ of *Cucullia verbasci* are also sometimes abundant. *Lycæna Corydon* is also abundant in the corn-fields to the north of that range, though I have never met with it on the south side. *Phibalapteryx tersata*, *P. vitalbata*, *Melanippe procellata*, *Eubolia bipunctaria*, and *Ilithyia carnella*, are common in many places; whilst *Lycæna Ægon*, *Fidonia atomaria*, *Selidosema plumaria*, and some species of *Psyche* are very common on the heaths lying between East Lulworth and Wareham. I feel sure that were a good entomologist to devote some time to collecting in the Isle of Purbeck he would be rewarded with many other local species than those mentioned, and very possibly something new, especially in the genus *Acidalia*, as I once had two or three examples of a species that appeared to belong to that genus that I could not refer satisfactorily to any in our list. They were taken on the open downs towards the south of the island, and appeared allied to *A. contiguaria;* but circumstances obliging me to give up collecting for several years they were destroyed without being shown to anyone competent to decide on their identity.—Thos. Parmiter; Halstock, Yeovil, November, 1881.

Hesperia Actæon.—I have for several years been expecting to see some such note respecting *Hesperia Actæon* as that from the pen of Mr. M'Rae (Entom. xiv. 252). From what I know of the habits of that species, I have long felt certain that if it were not entirely exterminated at Lulworth it would be so reduced in numbers as to become a great rarity there; though were such to be the case I have every reason to believe that it would still be found in some other part of the Isle of Purbeck, as I know it to have been taken abundantly in another locality near Swanage. I most sincerely hope, however, that Mr. M'Rae's advice will be taken, and all worn specimens allowed their life and liberty, the more so that I believe it to be invariably the habit of the larva to feed in a very limited area, and never farther from the sea than that its food can at times be wetted with the sea-spray. In support of this I may perhaps mention that I have several times searched the downs for several miles on either side of Lulworth, and, though its food-plant grows abundantly on all the downs, I only met with one specimen, and that at no great distance from the ordinary locality.—THOMAS PARMITER; Halstock, Yeovil, November, 1881.

HERMAPHRODITE HYBRIDS.—Having had my attention directed to the 'Entomologist' on the above subject by a friend, I saw the sketch of the insect (Entom. xiv. 217), and I am inclined to think it is one that I bred some eighteen years ago. I was glad to find in the next number (Entom. xiv. 253) that Mr. Kirby had replied to Mr. Briggs. I can fully endorse all that he says, having noticed the same circumstances that Mr. Howse speaks of. I bred both *ocellatus-populi* and *populi-ocellatus*, and distributed them in different parts of the country. I am not in possession of any now, and have given over collecting; but I shall have great pleasure in giving any information that I am able to any of your readers on the subject.—JOHN ADAMSON; 5, Darncombe Street, Moss Side, Manchester, December 15, 1881.

ORGYIA PUDIBUNDA DOUBLE-BROODED.—Last June I obtained a number of eggs of this species, and from these I had about two hundred pupæ. I was much surprised to find the imagos appearing on the 5th of this month, and since then twenty more have come out. Is this not a very unusual occurrence?—L. F. HILL; 4, Craven Terrace, Ealing, W., November 24, 1881.

ENNOMOS AUTUMNARIA AT FOLKESTONE.—On the evening of the 1st October I had the good fortune to take two fine specimens of this rare moth from street lamps in the outskirts of this town. —W. J. AUSTEN; Radnor Street, Folkestone, Nov. 21, 1881.

AMPHYDASIS BETULARIA IN IRELAND.—As this insect is not included in Mr. Birchall's list nor supplement, the occurrence may be worth recording. I met with a single specimen in the garden in Kingstown last summer, and the insect is now in the collection of my friend Mr. Kane.—W. E. Glazebrook; Science and Art Museum, Dublin.

Abraxas ulmata.—Referring to the remarks made by Mr. A. T. Mitchell, in the November number of the 'Entomologist' (Entom. xiv. 257), I may mention that during the early part of October I received larvæ of the above species from Sheffield, and owing to the difficulty after a week from that time in obtaining their food, the wych elm, most of the larvæ either died or changed to the pupa state while very small. This evening, on looking into my glass cylinder where I kept the larvæ, I found that two imagos had put in an appearance, very small, though perfect, specimens.—J. R Wellman; 219, Elm Park, Brixton Rise, S.W., November 18, 1881.

Eupithecia ultimaria, *Dup.*—I was very pleased on reading the remarks made by my friend Mr. Sydney Webb about this species in the last number of the 'Entomologist' (Entom. xiv. 300). I was quite satisfied myself at the time I took this species that it was perfectly distinct from *E. sobrinata;* its habits and time of appearance are very different, and if a set of each are placed side by side the difference is very perceptible. Besides many other characters it is much lighter and brighter; it varies quite as much as *E. sobrinata.* I have three specimen varieties, ticketed, in my cabinet, which I sent to Guenée, and he returned them in doubt as the *Eupithecia ultimaria* of Dup., not knowing that species. At the time of capture, or soon after, I forwarded specimens to Messrs. Doubleday, Allis, E. Shepherd, F. Bond, S. L. Waring, F. Grant, J. B. Hodgkinson, P. H. Vaughan, J. J. Weir, H. T. Stainton, J. W. Douglas, Major Sheppard, Sircombe, Greening, Edwin Brown, J. Hunter, and, more recently, Howard Vaughan. I have never been to the spot, where I captured them in the evening, since that time, which must be at least twenty-five years ago.—Samuel Stevens; Loanda, Beulah Hill, Upper Norwood, December 7, 1881.

Scarcity of Eupitheciæ larvæ.—During the last week in September I went twice to Bishop's Wood, near Selby, in this county, to work for larvæ of *Eupithecia albipunctata* and *E. trisignata.* I was much surprised to find none of either species. In former years it was abundant, and I could take large numbers in the same locality. I also went to two localities for *E. centau-*

reata and *E. absynthiata*, and there was the same rarity of those species. Not a larva to be found. *E. pimpinellata* six years ago was so common that I could get any quantity of larvæ close at home, and this year it took me one whole day to find four individuals. The larvæ of *E. castigata* I have not seen at all this year, although we usually find it on almost every plant. *E. subfulvata* seems to have quite deserted the yarrow.—W. PREST; 13, Holgate Road, York, October 16, 1881.

CORÉMIA QUADRIFASCIARIA.—In continuation of the notes on this species, in the October number of the 'Entomologist' (Entom. xiv. 229), perhaps my experience of its occurrence in Suffolk will be interesting. I have met with it in several localities, at Bentley, Felixstowe, and around Ipswich, but nowhere abundantly. It usually occurs in lanes and hedgerows, rather than woods; and an evening's "mothing" early in July will generally yield two or three specimens.—H. MILLER; Ipswich, October 24, 1881.

CIRRŒDIA XERAMPELINA IN SOMERSET.—I caught a specimen of this moth on a grass lawn in front of my house on September 18th. There is a gas-lamp near, which had probably attracted it.—W. MACMILLAN; Castle Cary, Somerset, Nov., 1881.

LEPIDOPTERA AT SOUTHWELL.—I have captured, this year, at Southwell, in Nottinghamshire, the following far from common insects:—In September the imago of *Sphinx convolvuli*, found on a gate-post, and given to me. Also I took one specimen of *Aplecta occulta* at sugar on some iron fencing; and last, but not least, the larva of *Acronycta alni*, which I fear is dead. This last was found on a road under overhanging elm and beech trees.—W. BAKER; Hill House, Southwell.

SCARCITY OF NOCTUÆ IN SOMERSETSHIRE.—Noctuæ have been very scarce at sugar this autumn, notably the commoner species. Not a single specimen of *Anchocelis pistacina*, *Cerastis vaccinii*, or *C. spadicea*, of which I generally see dozens. Only one *Phlogophora meticulosa* or *Agrotis puta*, very few *Mamestra brassicæ*, *Xylophasia polyodon* or *Triphæna orbona*. No *Catocala nupta* or *Xylina semibrunnea*, of which, with *X. petrificata*, I generally take a few. *Sphinx convolvuli* has not been uncommon, and of *Acherontia Atropos* larvæ several specimens have been found. Allow me to add that my old acquaintance *Polia flavocincta* has been constant to me, and I shall be glad to forward to anyone wanting the species, on receipt of box and return postage, a series of six, as far as they will go.—[Dr.] H. W. LIVETT; Wells, Somerset, October 14, 1881.

LIFE-HISTORY OF PLUSIA BRACTEA.—I have found that if a worn female of *Plusia bractea*, when captured, is placed in a large chip pill-box, in which a small aperture has been left for air, and the box is placed in a window upon which the evening sun shines, she will probably deposit some eggs. These are almost the colour of the chip upon which they would be laid, and are very small in proportion to the size of the insect. Later in autumn the eggs will hatch, and the young larvæ feed and grow till they are about half an inch in length, and are in colour a dull green. In spring they begin to feed vigorously and increase in size, and can then be distinguished from the larvæ of *P. V-aureum* by the segments being more marked and indented. As they grow they become of a richer and brighter green; and when about to spin up the caterpillar of *P. bractea* is a handsome larva, upwards of an inch in length, with only six prolegs; the anterior legs are generally black. It has a habit of elongating all the anterior segments, making them look very slender in comparison with the rest of the body. The dorsal line is very narrow, of a darker green than the ground colour, and between it and the spiracular lines are three wavy white lines; but all these markings are so minute that at first sight the larva appears of a uniform green. All the body below the spiracles is of a darker green than the upper surface; the face, which is almost flat, has a black stripe at each side; the mandibles are also black, and two prickly points on the last segments are dark in colour. The larva is sprinkled all over with almost invisible white hairs, which show at once if it is held against the light. It spins a white silky covering, through which the dark chrysalis can be seen; the cocoon is completed about the end of May or beginning of June. The imagos appear in June or the beginning of July; they are particularly fond of the flowers of honeysuckle and *Viola cornuta*, which they frequent just before dark, in company with *Plusia V-aureum*, *P. iota* and *P. chrysitis*; possibly, but rarely, with *P. interrogationis*. About four years ago I succeeded in rearing five splendid *Plusia bractea* on groundsel alone. When they were large enough to take out of the glass-topped box, a healthy young groundsel was placed in the centre of a flower-pot, and sandy earth filled in; round the inside rim of the pot four or five slender sticks were inserted and tied together at the top. Over all a muslin bag was placed and fastened round the flower-pot by an elastic band. Each time the plant became withered and sodden, and had to be changed, the little larvæ had to be diligently sought for, as they have a habit of burying themselves beneath the surface of the ground, and require sharp eyes and some patience to find them. My next essay was in 1881, when seven imagos rewarded my care. I gave these larvæ of *Plusia bractea* grass as well as groundsel, and they apparently enjoyed it, creeping up the stems and nibbling the blades; but I have reason to think this food did not agree with them, for when nearly full grown they suddenly ceased feeding and began to spin up: twenty-three cocoons clustered together on the stems of grass, and a few others on the muslin bag; seven only emerged, and after waiting patiently I opened a cocoon, and found the chrysalis contained a dark fluid; all the others were similarly decayed. A friend, with whom I shared my eggs, reared nine beautiful specimens successfully upon groundsel, young honeysuckle, nettles, and cow-parsley (*Chærophyllum sylvestre*), remarking that in spring the larvæ seemed particularly fond of the latter plant. Probably a more varied diet might have saved some of my caterpillars from dying in the pupa state, had I thought of it in time. I am sorry to say I have no duplicates to offer; as yet I have been unable to supply even my friends' cabinets with this rare moth, which is so capricious in its appearance that during some seasons not even one specimen is secured.—FRANCES ISABELLA BATTERSBY; Cromlyn, Rathoven, West Meath, Ireland, December 7, 1881.

LEPIDOPTERA ATTRACTED BY ELECTRIC LIGHT.—Noticing in a recent number of the 'Entomologist' that several correspondents had noticed the attractive power of the electric light for Lepidoptera, it may interest some of the readers to know the result of occasional collecting at the electric light, which is being used in this town (Eastbourne) by the contractor for the new sea-wall. In the middle of June, hearing from a lad "that there was a rare sight of owls at the electric light," I paid it a visit, and found that insects literally swarmed around it. I soon commenced operations, and had my boxes full in a short time. Amongst the species I had were *Arctia fuliginosa*, *Notodonta dictæa*, *N. ziczac*, *Dicranura vinula*, which, with *Pygæra bucephala* and *Amphydasis betularia*, came up rank upon rank; I had also *Dianthœcia conspersa* and *Cucullia umbratica*. I felt very well satisfied with my first night's work, and was just packing up to go when down dropped a fine *Smerinthus ocellatus* on the beach in front of me. I had scarcely bottled him when down came a splendid *Chærocampa porcellus*, followed by *C. elpenor* and *Sphinx ligustri*. It was very interesting to note the effect the light had upon different species: some, such as the *Sphingidæ*, when within three yards of the light dropped on the shingle as if paralysed; whilst others, such as our troublesome friends *Triphæna pronuba* and *Plusia gamma*, &c., went dashing against the carbon as if leading a forlorn hope. I have observed, too, that some species delight in having a night to themselves: for instance, I visited the light about the end of June, and *Zeuzera æsculi* came up in swarms, while next night there was not one to be seen. Later on *Chelonia caja* and *Bombyx quercus* had a benefit night. I have worked this light at odd times up to the end of September, and have taken seventy different species, none of them very rare, but affording sport and interesting observation. Amongst others I have taken *Cossus ligniperda*, *Lithosia quadra* (female), *Liparis monacha*, *Ennomos tiliaria*, *E. fuscantaria*, *E. erosaria*, *Platypteryx falcula*, *Clostera curtula*, *Ptilodontis palpina*, *Bryophila glandifera*, *Nonagria typhæ*, *Agrotis aquilina*, *Noctua glareosa*, *Agrotis saucia*, *Epunda lichenea*, *Plusia festucæ;* and saw *Sphinx convolvuli*, but out of reach. I think I can safely say that if the light had been worked more often I should have been able to record some rarities taken which occur about here.—James T. Dewey; 11, Tideswell Road, Eastbourne, November, 1881.

Plagiodera armoraciæ, *L.*—I notice some remarks upon this beetle, by the Rev. W. W. Fowler, in the December issue of the 'Entomologist' (Entom. xiv. 293). Having lately received a series of the insect, together with a short account of its habits, from Mr. G. Lewcock, I append, with his permission, an extract from his letter:—"I have taken *P. armoraciæ* several years. I find it extremely local, occurring on about nine willow trees only, and seeming never to leave their locality. It prefers the trees situated on banks of small streams, and may be observed early in August on any herbage growing beneath the willows. As the cold season approaches it hybernates beneath the bark of trees, not showing preference for rotten or sound ones. I have found specimens as early as August 5th, and through the winter up to April and May." This would seem to prove that the insect is less rare than is generally supposed; it may, possibly, be often passed over as the common *Phædon cochleariæ,* to which it bears a considerable resemblance.—THEODORE WOOD; 5, Selwyn Terrace, Jasper Road, Upper Norwood, December 8, 1881.

THE GENUS PHÆDON.—There is one error in Mr. Fowler's, otherwise valuable, paper on the above subject, which I venture to correct. In the paragraph headed *Phædon cochleariæ* (p. 294), Mr. Fowler says, "This is the insect referred to . . . . . . by Mr. Hart." This, however, is not the case. I am well acquainted with *P. cochleariæ*, and find it abundantly on watercress, but have never found *P. betulæ* in its company, although I have examined hundreds of specimens in that expectation. I meet with *P. betulæ* most commonly in flood-refuse, but have on a few occasions found it on water-starwort, at which times the beetles have been paired, and apparently quite at home. The object of my query (Entom. xiv. 187) was to ascertain if others had observed the habits of the insect more closely than I had been able to do; certainly not to raise the question of synonymy. During the last two seasons I have paid considerable attention to our common phytophagous beetles, with a view to better understand the economy of those that injure our crops, and my observations lead me to believe that of the common species of *Phædon, P. cochleariæ* is the only one that habitually feeds on *Cruciferæ.* Of course it is well known that insects sometimes forsake their regular food-plant, and attack another of quite a different order, as, for instance, *Gastrophysa polygoni*, leaving the knot-grass and attacking barley. It would also seem that a certain species does not always feed on the same plants, or even the same order of plants, in two different countries. I believe it is Kirby and Spence who mention that the elm trees near Paris were severely injured by *Galeruca calmariensis,* which beetle in this country feeds on the purple loose-strife. However, it requires further and extended observations yet to decide what is the food-plant of many of our beetles; and I hope in the spring to again look into the subject, when I shall endeavour to make use of the information contained in Mr. Fitch's note in reply to my query. In reference to *P. tumidulum*, I may add that I have commonly seen this beetle feeding on the leaves of *Heracleum sphondylium*, sometimes in great numbers, but, as yet, on no other plant.—THOS. H. HART; Kingsnorth, December 8, 1881.

ADDITIONS TO NOTES ON DIPTERA.—In the few observations which I published in the last number of this Journal on Parasitic Diptera and their victims (Entom. xiv. 285) I made several omissions, which I am glad to have an opportunity of correcting. Mr. Bignell has written to remind me that he sent me, some time back, two specimens of EXORISTA LOTA, Meig., which he had bred from larvæ of *Acronycta psi*; also one of SCOPOLIA OCYPTERINA, Zett., reared from *Pterophorus tephradactylus*; he has now forwarded me several other Tachinids, lately bred by him, which I have great pleasure in adding to my list; they are as follows:—1, EXORISTA VULGARIS, four varieties? parasitic upon the four following Lepidoptera, viz., *Pieris rapæ*, *Mamestra persicariæ*, *Tæniocampa populeti*, and *Oporabia dilutata*. 2, EXORISTA GNAVA, Meig., from *Orgyia pudibunda*. 3, EXORISTA FAUNA, Meig., from *Cossus ligniperda*; and PHOROCERA CONCINNATA, Meig., from *Notodonta chaonia*. Mr. Fletcher has been good enough to send me a notice of the following additions which he has made to the list of parasites which he has bred, viz., EXORISTA VULGARIS, from *Plusia gamma* and *Vanessa urticæ*; THRYPTOCERA SETIPENNIS, Fall., from *Coccyx strobilella*; and a small species of DEGEERIA, from *Tinea cloacella*. The two last he sent to me for examination a year or two ago (when I could not satisfactorily determine the name of the *Degeeria*), but I had forgotten the circumstance when I drew up my paper; Mr. Fletcher also sent me at that time a specimen of EXORISTA FESTINANS, Meig., but did not know the name of the larva from which it was bred, only that it was lepidopterous. Among the general remarks which I made upon parasitic flies, I mentioned that I had received some specimens of *Dilophus vulgaris* from Mr. Bridgman, said to have been reared by Mr. F. Norgate from *Catoptria hypericana*; I have since had some correspondence with the latter naturalist, and find that a mistake has been made; and that the above-named flies must have been mixed up and confused with some parasitic species which had been lost.—R. H. MEADE; Bradford, December 17, 1881

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THE LINNEAN ORDER NEUROPTERA.

By JAMES J. KING.

WHY is it that we have so few entomologists in this country who will devote their attention to anything excepting the Lepidoptera and Coleoptera, to the utter neglect of many other groups that are in no way less interesting? This is a matter that has occupied my attention for some time, seeing that we have so many orders of insects that are no less attractive, and whose history is almost unknown.

No doubt, during the last few years, we have had a small number of workers who have taken up the Hemiptera and Hymenoptera, but I am sorry to say that the workers at that most interesting and beautiful order of insects, the Neuroptera, might almost be counted on the fingers of a person's hand. Why this should be the case I cannot understand, seeing that we have such great diversity of form and colouring among the various species of this order, many of which, for example, *Cordulia* and *Calopteryx* among the dragon-flies, are adorned with most gorgeous metallic colours.

I think that I could do no better than enter into a short description of the most characteristic of the Neuroptera. This order, as generally understood in this country, embraces groups of very unequal systematic value.

Some of the Neuroptera are closely related to the Orthoptera, as will be seen from the structure of the wings, which are of a membranous character and are traversed by a large number of veins which form little facets from which light is reflected.

The Trichoptera are evidently nearly allied to the Lepidoptera, many of the *Leptoceridæ* bearing considerable resemblance to moths. Doctors differ very considerably on the question of the nearest allies of the Trichoptera. Our greatest living authority on the group lays great stress on their resemblances to the Lepidoptera. Prof. Westwood also wrote long ago that the genus *Phryganea* "forms the connecting link between the Neuroptera and Lepidoptera." On the other hand, the well-known American entomologist and, be it said, embryologist, at the same time, Dr. Packard, maintains as strongly their affinities. A discussion of the *pros* and *cons* in the matter would, however, be out of place in a paper like the present.

Some entomologists divide the Linnean order Neuroptera into two independent orders, owing to variations in the metamorphosis and the development of the mouth-organs: in some species, such as the dragon-flies, these organs are highly developed, which gives to the species that bear them great advantages in attacking their prey; whilst in others, such as the Trichoptera, they are not adapted for any serious work. But, for our purpose, I think that we will adopt the three suborders used by Mr. M'Lachlan in his 'Catalogue of British Neuroptera,' namely, Pseudo-Neuroptera, Neuroptera-Planipennia, and Trichoptera.

Under Pseudo-Neuroptera come those lovely little insects the *Psocidæ*, which abound during the summer in the foliage of various trees, such as firs, yews, &c. Some genera of the *Psocidæ* are not at present so well understood as is desirable, there being no doubt a good deal to do among many of the more obscure inquilines. Many species, again, are only too well known to collectors of natural objects as things to be dreaded rather than admired, such as *Atropos divinatoria*, *Clothilla pulsatoria*, *Cæcilius pedicularius*, &c. Uneasy is the head of him who keeps a collection, for species like those just mentioned cause him to take perhaps rather more interest in his stored favourites than their individual merits might otherwise call for. In this family we have in Britain about thirty species. Micro-lepidopterists could easily take up these living atoms, as they must come across most of the species while searching for micros.

Other groups of the Pseudo-Neuroptera are the *Perlidæ* or stone-flies, and *Ephemeridæ* or May-flies, insects which all anglers, as well as entomologists, must be acquainted with.

The Stone-flies are at present very little understood, owing in great part to the difficulty in studying them, as they shrink up unless preserved in fluid. About a couple of dozen species are recorded as occurring in this country.

The *Ephemeridæ* or May-flies are easily known from the shape of the wings, their very short antennæ, and also by the possession of two or three long setæ, which project from the anal segment; the setæ are often as long as or longer than the wings. Some of the stone-flies have long setæ, but these can be at once separated from the May-flies by their long antennæ, ample hind wings, &c. About forty species of May-flies occur in this country. The best method of preserving the stone- and May-flies is in fluid. The Rev. A. E. Eaton, the best authority on the May-flies, says, "It is sufficient for ordinary purposes to dip the freshly-killed specimen into dilute spirits, and then transfer it to a tube or homœopathic globule bottle partly filled with water; next, Price's glycerine is added to the water,—one or two drops a day,—until the bottle is gradually filled. A small drop of acetic acid may be added finally, to prevent the growth of mould."

The *Odonata*, or dragon-flies, are familiar to all who may ever have happened to take a walk during a warm summer day near a weedy pond, where these insects may be seen hawking after their food, *viz.*, small insects, or carrying on a very important duty, their amours. I know no more beautiful sight than that of a few of the "Devil's darning-needles" (as they are familiarly called in Scotland) making their exquisite curves while chasing one another in some quiet glade near a picturesque pool. About half-a-hundred species are known to occur in Britain, of which many are adorned with the most brilliant metallic colours, which do not fade; unfortunately a few of the more tender-bodied ones do fade, but then it is always possible to pick out a few from a series that have retained most of their colour. It must also be borne in mind that specific distinction depends more on structure than on colour in the Neuroptera.

The second suborder is the Neuroptera-Planipennia, or lace-wing flies, which are no doubt the most lovely of all the British Neuroptera, one or two of the dragon-flies excepted, many of the species rivalling any of the Lepidoptera in beauty of colour, although the colours in the *Planipennia* are produced by different means, namely, by iridescence. Characteristic insects of the group are the following: the *Raphidiidæ*, insects that are remarkable for the elongate development of the head and prothoracic segments, which has caused them to be called snake-flies. The larvæ of the *Raphidiidæ* live under the bark of trees, where they prey upon other small insects. The *Osmylidæ* are not very numerous in this country; but one species, *Osmylus maculatus*, Fab., is truly a handsome creature; it may be taken by beating, over a net, the bushes, &c., that overhang streams. The *Hemerobiidæ* consist of eighteen species, which are very unequally divided among four genera, the genus *Hemerobius* alone absorbing thirteen species. The larvæ probably partake of the habits of the *Chrysopidæ*. The imagos as a rule feign death when beaten into the net, and if you have had a long "beat" it is surprising to see the numbers that are constantly cropping up while you are examining the contents of your net. Many of the species are extremely pretty both in markings and colour, notably *H. atrifrons*, M'Lach.; *H. pini*, Steph.; and *H. concinnus*, Steph.

We now come to the insects that I believe all people admire; at least I know that most of those who care for insects are attracted by them, for when I ask any of my correspondents if they ever take Neuroptera I am pretty sure to get a few *Chrysopidæ*, that is to say, should I by chance get anything at all.

The *Chrysopidæ* are those gauzy-looking green creatures with golden eyes, from which latter character comes their popular name of "golden eyes." Some species are also called "stink-flies," from a very disagreeable odour they give out when caught. These insects are very common in woods; they seem not to be endowed with any great power of flight.

The *Coniopterygidæ* are very minute insects, covered with a fine mealy substance of a slightly violet tinge, which rubs off very readily; the three species that occur here are to be beaten out of trees almost everywhere.

The *Panorpidæ*, or scorpion-flies, so named from the formidable-looking appendages of the male, which give to these insects a dangerous appearance, are not numerous in this country, only three species of the genus *Panorpa* being at present known; these species occur somewhat commonly among rank herbage.

The third suborder of the Neuroptera (Trichoptera) will now take up our attention, and, to use the words of one author, "We meet with a number of flies of no particular beauty, but which, from the peculiarities of their structure and habits, are of considerable interest to the entomologist." With regard to the first portion of this quotation, I may say that there will always be some people who will differ from others as to what constitutes beauty.

These insects in their larval state are almost all aquatic; they build for themselves cases composed of any materials that may come handy: some species make their cases of grains of sand, fixing them together by means of delicate silken threads which the larva spins from a spinneret situated beneath the labium; others, again, use shells, stones, and stems of aquatic plants.

The British Isles are about as well represented as to number of species as almost any other country, the number recorded from Britain being upwards of one hundred and fifty species, which are distributed among seven families, the *Limnophilidæ*, *Leptoceridæ*, and *Hydropsychidæ* absorbing most of the species; the *Limnophilidæ* being represented by fifty-two species, the *Leptoceridæ* by thirty-two, and the *Hydropsychidæ* by thirty-one. Many of these insects attain a large size, *Halesus digitatus* being nearly two inches in expanse of wing; many other species approach this size.

The *Leptoceridæ* are remarkable for the length of their antennæ; in many species these organs are much longer than the wings. Some species of this family are very handsome, *Mystacides azurea* being of a lovely steel-blue; *M. longicornis* is beautifully banded, reminding one of the Lepidoptera; while *Setodes argentipunctella* is spotted with small silvery scales.

The *Hydroptilidæ* form a small family of insects that might easily be mistaken for Lepidoptera, so closely do they resemble some of the *Elachistidæ* in their general appearance.

The caddis-flies are only to be made out with certainty by an examination of the anal characters, more particularly those of the male. Caddis-flies are to be found in almost all situations where water occurs, the *Limnophilidæ* delighting in stagnant water; others visiting streams to pass their larval state; while for some species, such as *Chimarra marginata*, the highly aërated water of a mountain torrent is necessary for their existence. Some species, probably of strong flying powers, are to be found far removed from water.

I think that I have said sufficient to show that we have infinite variety in the Neuroptera; so that the most fastidious may easily get some group to please him, and also that they are to be found in as many localities as Lepidoptera, and in fact can easily be collected with them.

I should not close this paper without giving a hint as to the literature bearing on the Neuroptera. I will only refer to books published in England:—"A Catalogue of British Neuroptera," compiled by Robt. M'Lachlan, F.L.S., and Rev. A. E. Eaton, B.A.; published by the Entom. Soc. Lond., 1870. "A Monograph of the British *Psocidæ*," by R. M'Lachlan, F.L.S.; published in the Ent. Mo. Mag., vol. iii., 1867. "A Monograph of the *Ephemeridæ*," by the Rev. A. E. Eaton, B.A., in the Transactions of the Entom. Soc. Lond., Part i., 1871. "A Synopsis of the Dragon-flies," by Dr. Hagen, in the Entomologist's Annual, 1857. "A Monograph of the British Neuroptera-Planipennia," by R. M'Lachlan, F.L.S., in the Transactions of the Entom. Soc. Lond., Part ii., 1868. 'A Monographic Revision and Synopsis of the Trichoptera of the European Fauna,' by R. M'Lachlan, F.R.S., F.L.S.; published by John Van Voorst, London. As yet we have not a Monograph of the *Perlidæ* in English, but I may mention Pictet's 'Histoire Naturelle générale et particulière des Insectes Névroptères, Famille des Perlides,' Geneva, 1841–42.

As to preserving: the Neuroptera should all be pinned, with the exception of the *Perlidæ* and *Ephemeridæ*, which are best preserved in fluid as above described; the pin should be driven so far through the thorax that no part of the insect, when set and pinned into the case, will touch the paper. Carding Neuroptera should always be avoided, as it is impossible to examine the under side, &c., if so prepared.

In conclusion, I may state that I shall be most happy to render assistance to anyone who may take up any section of this much-neglected order, by sending types or naming specimens, excepting in the *Perlidæ* and *Ephemeridæ*.

207, Sauchiehall Street, Glasgow, November, 1881.

CONTRIBUTIONS TO THE HISTORY OF THE BRITISH *PTEROPHORI.*

By Richard South.

(Continued from vol. xiv., p. 77.)

It has been suggested to me that in drawing up my list of the British *Pterophori* (Entom. xiv. 50) I did not pay sufficient attention to the priority of synonyms. I admit that possibly such may have been the case, but confess that I feel greater interest in the investigation of habits of the group, than in working up the entomological literature of the remote past to discover who was, or was not, the original nomenclator of this or that species. In this I may evince a lack of scientific precision, but I submit that although the priority of nomenclature is of great importance, still it is not the first matter to be considered in the study of any group of natural history objects. Let us become thoroughly acquainted with the objects themselves, then we can proceed to discuss the question of priority of synonyms.

In the present paper I shall speak of the "plumes" captured by me in North Devon last season, and in so doing will adopt the generic nomenclature as given in my list (Entom. xiv. p. 75), thus anticipating possible objections on this score.

Platyptilia, Hüb.

Trigonodactylus, Haw.

Gonodactyla, W. V.?

Imago.—Expanse, 10–12 lines. Fore wings, ground colour whity brown, sparingly sprinkled with brownish scales. The most prominent markings are a brown triangular blotch on the costa, the apex of which is situated just before the digital juncture. The posterior edge of this triangle is margined with whitish, most conspicuous on the costa; beyond this is a brown linear mark, also on the costa, followed by a narrow whitish line running from costa to inner margin through the digits, and parallel with the hind margin. Fringes pale grey, with a tuft of black scales, in middle of inner margin, also at tip and angle of inner digit; but these two last are not conspicuous. The tip of outer digit is not produced, and hardly pointed. Hind wings grey-brown; third feather with a tuft of black scales in the cilia of its inner margin; between this tuft and the base of the feather the cilia are whitish. Head and thorax same colour as fore wings.

Larva.—Length 7 lines, moderately stout. Head shining black, and but little smaller than 2nd segment, the upper part of which segment is also shining black. Ground colour whitish, with a broad dorsal and narrower subdorsal stripe rosy brown. Several small black warts, from which short black hairs are emitted, are scattered over the dorsal and subdorsal areas; these are rather larger on the 3rd segment. There is also a row of larger black warts along the spiracle line.

The larva feeds in flower-heads of *Tussilago farfara* during April and May.

Pupa.—Upper part like the larva in coloration, but paler, and not hairy. Wing-cases light brown, more or less streaked with darker. May be found among seed-down, in heads of food-plant, in May.

It will be observed that the description I have given of the imago is not that of the ordinary form of *P. trigonodactylus*. Again, compare my description of the larva with that given by Mr. Peers (Entom. ii. 38), and it will be found that a very material difference exists. Mr. Peers says of the larva he describes, "dorsal line light brown; subdorsal line broader, lighter brown; head and 2nd segment fulvous." Here, then, is either discrepancy or descriptions of the larvæ of two very closely-allied species, sufficiently distinct as larvæ, but not easily separated as imagines. I have no reason to doubt the accuracy of Mr. Peers's observations, as recorded, more especially as all the imagines bred from my larvæ were of the same pale colour, and uniform in the character of the apex of anterior wings, in both respects differing from the examples of *P. trigonodactylus* which I had usually taken in the imago state in other parts of England.

I have before me just now my bred series, and a set of captured specimens from Kent and elsewhere, including one or two taken in North Devon, quite a month after my last pupa had disclosed its imago. The best comparison I can make between the two sets is to say that the bred insects look bleached and worn by the side of the captured specimens.

Mr. Doubleday would appear to have had some doubt as to whether *P. gonodactyla*, W. V., was synonymous with the *P. trigonodactylus* of Haworth; at least I take this to be the meaning of the ? after *P. gonodactyla* in his synonymic list.

I believe my North Devon insects to be identical with the *P. gonodactyla* of the Continent, and I think it may be found that we have two species in our cabinets under the name of

Platyptilia trigonodactylus ; but I am not at all satisfied with my present knowledge of this species, and shall feel greatly obliged to anyone who will kindly favour me with a few full-grown larvæ of the coltsfoot-feeding "plume" from any locality, during the season. Mr. Sang was kind enough to send larvæ from Darlington, but I did not have an opportunity of seeing them, as I had written to Mr. Carrington that I had found coltsfoot-feeding "plume" larvæ in North Devon, and it was not considered necessary to forward other examples.

PLATYPTILIA, Hüb.

Zetterstedtii, Zell.

IMAGO.—Expanse, 10–14 lines. Fore wings, ground colour whitish ochreous, with a few brown scales scattered over the disk of the wing. A dark brown triangular mark is seated on the costa just beyond the middle, the apex of which is near the digital juncture. On the costa, between this triangle and the base of wing, is a series of dark brown (in some specimens approaching black) spots of small size, and often so closely placed as to give the appearance of a line. The posterior edge of triangle is margined with a dash of the ground colour, and beyond this both digits are suffused with paler brown, in some examples almost black on the costa, and intersected by a line of the ground colour running parallel with the hind margin; the hind margin itself is distinctly outlined with black. Along the inner margin, a short distance from the base, is an oblique dash of dark brown, and a little outside this, but nearer the costa, is a small dark brown spot; there is also a patch of dark brown on the middle of inner margin. Fringes white, with tufts of black scales on the middle of inner margin, at the angle of inner digit, and a smaller one between those two. In strongly-marked examples the tip of inner, and angle of outer, digits have black tufts also. The tip of the outer digit is pointed, but scarcely produced. Hind wings pale brown; fringes hardly paler, except those of third feather, which are white from the base to the tuft of black scales in the middle. Head and thorax same colour as fore wings. Abdominal junction paler.

LARVA.—Unknown to me. Wallengren says that it feeds in the stems of *Senecio nemorensis* (not a British plant); and Heinemans gives *Solidago virgaurea* as the food-plant. Plenty of this latter grew in the woods where the insect occurred in North Devon; therefore in this country we might expect to find the larvæ feeding on the latter plant.

It may be that I did not stumble across the head-quarters of this insect, and that the few examples I met with were stragglers;

but they were certainly in very fine condition, especially one female, which is so large and so strongly marked that I have, until just lately, considered it a distinct species. Comparison with a not very good continental type of *P. nemoralis* led to the error of supposing it to be an example of that species, as lately figured (Entom xiv. 304). When I state that the specimen measures rather over 14 lines in expanse, and that the largest of my other specimens—including several from Kent—does not exceed 11 lines, my former conclusion will not perhaps appear surprising

AMBLYPTILIA, Hüb.
Tæniadactylus, Mihi.

IMAGO.—Expanse, 9½–10 lines. Fore wing, ground colour pale ochreous-brown, dusted with darker brown scales; a narrow dark chocolate line edges the costa, and a dark chocolate-brown stripe runs along the inner margin. This latter is interrupted or broken by three blotches, rather paler than the ground colour: one at the base, one in the middle, and one between this and the angle of inner digit. There are three conspicuous dark chocolate-brown marks: the first, somewhat triangular in shape, has its base on the costa just beyond the middle, and its apex in close proximity to the digital juncture; the inner half of this triangle is much darker than the costal half, and its posterior edge is distinctly edged with whitish, especially so on the costa. Beyond this the second and third marks represent a broadish fascia, interrupted by the fissure; its posterior edge is sharply defined by a whitish line running parallel with the hind margin. Fringes black, streaked along the inner margins with white. Tip of outer digit acutely pointed. Hind wings dark grey-brown, with only slightly paler fringes, except third feather, which has an elongate patch of black scales in the middle, and between this and the base of feather, whitish cilia. Head and thorax colour of fore wings. Abdominal juncture whitish.

Three fine examples of this "plume" occurred to me in a locality close to the sea in North Devon, where I have reason to believe that this insect has been taken before on two or three occasions, and exists in cabinets at the present time under the name of *Zettersteditii*. This is the case in the Doubleday collection at the Bethnal Green Museum. It may be at once separated from the last-named species by its narrow wings, the structural character of which would seem to indicate its belonging to the subgenus *Amblyptilia*. The ground colour and markings certainly favour *Zettersteditii*, but only superficially, for on comparison the dark brown digital fascia and black cilia sufficiently establish its claim to rank as a distinct species. I therefore propose for it the name *Tæniadactylus*, and its place in our collections is between *P. Zetterstedtii* and *A. acanthodactylus.*

OXYPTILUS, Zell.

Lætus, Zell.

IMAGO.—Expanse, 9 lines. Fore wing, ground colour whitish ochreous, more or less clouded with pale brown. The costa is narrowly edged with darker brown. The markings are few and inconspicuous. A black linear spot on the disk of wing always distinct, and at the digital juncture—which is nearly in the centre of the wing—are two small dark brown spots, and a faint white dash indicative of a line; and beyond this are two white lines running through the digits and their fringes. Tips of both digits sharply pointed, that of the inner deflexed. Fringes grey-brown, streaked with black and white, except along the middle of the inner margin, where they are whitish, with a small patch or two of black. Hind wings brown; fringes paler; a small tuft of black scales on the third feather beyond the middle, and a few white ones towards the base. Head and thorax colour of fore wings. Abdominal junction much paler.

The insect taken in Norfolk, and hitherto referred to this species, should be labelled *Distans*, Zell., in our cabinets. I was fortunate enough to meet with the true *Lætus* in North Devon during the last week in July, but only secured three specimens, although I put into practice every expedient known to me as usually successful in the capture of "plumes."

I understand from Mr. Meek that he has seen specimens from Kent, and, as far as I know, in that county and North Devon, are the only known British localities for *Lætus*, and at neither place has *Distans* been seen. On the other hand, in Norfolk, at the locality for *Distans*, *Lætus* does not appear to occur.

Oxyptilus distans, especially the continental type, is a broader-looking insect, and in colour much darker than *Lætus*. This darker ground colour throws up the whitish markings (which are nearly identical in form and position in both insects), consequently they appear rather more distinct. The black linear spot on the fore wing of *Lætus* shows up very distinctly. The smaller, more compact black tuft on third feather of hind wing, in conjunction with the marked difference of ground colour, constitute, I submit, trustworthy points of distinction between these two closely-allied species.

These comparisons are made from a series of examples of each species, including continental types. The latter were kindly given to me by Dr. Jordan, to whom I am also indebted for the privilege of examining his splendid collection of *Pterophori*.

I take this opportunity of thanking Dr. Jordan for the great courtesy shown me on the occasion of my visit to Edgbaston.

I believe North Devon would be found very rich in species of *Pterophoridæ*, if one's whole energies could be put into the work of hunting them up. Nearly all the specimens I got were taken in a casual manner, while collecting other species. Certain species of Macro-Lepidoptera were my particular quarry, but whilst searching for them I always had an eye for the "plumes."

Besides those species referred to in this paper I met with several others, about which I shall have something to say in an early number of this magazine.

12, Abbey Gardens, N.W., January 17, 1882.

A *COLEOPHORA* NEW TO BRITAIN.

By J. B. Hodgkinson.

I have to thank Mr. H. T. Stainton for kindly confirming my opinion as to the novelty of my species. He considers it very distinct, and most nearly allied to *C. badiipennella*, on account of having the distinct pale costal streak from the base of the costal cilia; but the ground colour of the wings is far glossier than in *C. badiipennella*.

Quite a dozen years ago, on a salt marsh beneath Humphrey Head, near Ulverston, I took a considerable number of this insect, and sent it away pretty freely as *C. salinella*; about three years ago I paid a visit with Mr. Threlfall to the same place, and a two days' hunt only yielded a score or so for each of us; since then I have made the acquaintance of the true *C. salinella*, which I find is a totally distinct species from mine. *C. salinella* being a larger insect and of a pale yellow colour, whereas the insect which I propose to name *C. adjunctella* is a shorter winged insect and of an olive-brown ground shade, it is clearly distinct from *cæspititiella* by the white streak that runs along the costa; also the wings are more arched, and in fine specimens there is almost an absence of streaks; the antennæ are much darker, nearly black, and more robust than in *C. cæspititiella.* The food of the larva has yet to be discovered; there were neither rushes nor *Luzula* about that I remember; we had to get them by creeping on our hands and knees, the place being too bare to sweep, and had to place our backs against the wind when we wanted to box any of the specimens.

15, Spring Bank, Preston, December, 1881.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Hesperia Paniscus and other Lepidoptera near Lincoln.—In a wood about seven or eight miles from Lincoln, while hunting for Coleoptera, on June 2nd last, I saw *Hesperia Paniscus* evidently not uncommon in one locality. On two subsequent occasions I visited the wood, but each time a thunderstorm, followed by heavy rain, came on just as we reached it, and stopped our operations; we, however, took one specimen each time, showing that it was still out, and I have no doubt that the insect was fairly plentiful. *Hesperia Tages* and one or two other "skippers" are also found in the same wood, as well as three or four species of *Argynnis*, and, above all, *Apatura Iris*, which I am told at some seasons may almost be called abundant in that locality. This is evidently not a rare species near Lincoln. One was captured this summer in the suburbs on a bed of Zinnia flowers in the garden of a friend of mine, and another was seen flying almost in the town. *Arge Galathea* is very abundant in a field near the wood above alluded to, and I took one specimen in a drive in the wood itself; the commonest butterfly seems to be *Satyrus Hyperanthus.* Mr. Baxter, taxidermist, of Lincoln, who kindly pointed out to me the locality, has shown me specimens of and given me notes about the following, as all taken by himself or his friend Mr. Meade in or near the same wood:—*Notodonta dictæoides*, not uncommon; *Notodonta dictæa*, rare; *Amphydasis prodromaria; Eurymene dolabraria; Ennomos erosaria* (this, I think, is a new locality for this insect); *Liparis monacha*, common; *Geometra papilionaria* (this is found in more than one locality in the neighbourhood); *Phorodesma bajularia; Scotosia undulata; Cidaria silaceata; Acronycta leporina; Aplecta herbida;* and many others. The wood has never been worked, except in a very desultory manner, and from what I have seen I believe that it would prove quite equal to many of the woods that are household words to entomologists, such as Darenth or Burnt Woods; moreover, it is entirely open to the public, and there is no interruption whatever from keepers. It may therefore seem strange that I have not mentioned the name and direction of the wood, but I have not done so on purpose. Mr. Baxter, above referred to, whose kindness in pointing out his particular localities is very rare, and hardly to be expected in a professional naturalist, showed the locality to some people, who did their best to exterminate *H. Paniscus* some time ago, and we do not wish for a like experience. Besides this, the wood is noted for its lilies of the valley, and when the wife of the holder was telling me the other day about the ravages of the public, who not only took the flowers, which they did not mind, but the bulbs as well, I could hardly help urging her to get the wood shut against all manner of collectors whatever. This damage and extermination of everything worth collecting and carrying away is a matter for the very serious consideration of entomologists, as through it nearly all the best collecting grounds are being gradually closed. Sherwood Forest, the paradise of midland entomologists, has nearly gone the way of the rest: a man who walked the forest a year or two ago with a net, and took pheasants' eggs instead of butterflies, has nearly put the finishing touch to the exasperation of the keepers. I think that all of us who are interested in the study of Entomology should once and for all continue to stop ravages and damage of all kinds whenever we may come across them—for although, as in the case mentioned above, it may be a pseudo-entomologist who causes the odium, yet in many cases collectors themselves are to blame for their utter disregard of everything except their own pursuit. With regard to extermination, it seems almost a pity that we cannot have some law to protect our more conspicuous indigenous insects, as well as our indigenous birds. One or two species either have disappeared, or are disappearing, owing to drainage and other causes, over which we have no control; but insects such as *Hesperia Actæon* and *Lycæna Arion* seem in a fair way towards extinction, simply owing to the mere greed of collectors. If they would only follow the valuable suggestion of Mr. M'Rae, in last month's 'Entomologist,' and let the worn females go, they might keep good series, and yet not lessen the number of specimens. I need hardly say that I shall have much pleasure in pointing out the exact locality of the wood referred to, to anyone really interested in Entomology who would like to work it.—(Rev.) W. W. FOWLER; Lincoln, November 8, 1881.

ZYGÆNA FILIPENDULÆ, VARIETY.—During a visit to Wyre Forest, on July 3rd last, I captured a remarkable variety of *Z. filipendulæ*. The fore wings are of the usual dark green, the spots being black; the hind wings are black, with a dark green margin. The insect measures 1 inch 2 lines, and the spots are rather small.—J. E. NOWERS; Burton-on-Trent, Dec. 7, 1881.

SPHINX CONVOLVULI IN SCOTLAND.—I received from my brother, who resides in Kirkcudbrightshire, a male specimen of *Sphinx convolvuli.* He states having captured it on the evening of September 23rd in the window of an adjoining house. It was received by me alive, but in poor condition.—D. MACADAM HALTWHISTLE; Northumberland.

SPHINX CONVOLVULI IN SCOTLAND.—A fine specimen of this moth was taken about the middle of September in a grocer's shop in Dalbeatie. It is now in my collection.—J. J. ARMISTEAD; Douglas Hall.

SPHINX CONVOLVULI IN THE SCILLY ISLES.—During a visit to the Scilly Islands this summer, I went to the island of Tresco (where the governor resides) for the purpose of seeing the almost tropical vegetation of Mr. Smith's (the governor's) grounds, and it certainly was very extraordinary to see growing in the open, at such a short distance from England, the wonderful variety of trees and plants; for instance, pepper trees in fruit, large camphor trees, cinnamon trees, huge aloes (twenty-eight being in bloom at the time of my visit), bamboos (I should say twelve to fourteen feet high), and several species of *Eucalyptus.* The gardener pointed out one which he said was the largest specimen of *Eucalyptus globulus* in Europe. Any quantity of Cacti and plants too numerous to mention. On September 8th I was much pleased by the head gardener bringing me alive a fine specimen of *Sphinx convolvuli* that he had captured that morning. He said that it was the first he had seen or heard of being taken in these islands. I should like to know, as I may possibly visit this island (Tresco), St. Mary's, and others again, whether this growth of almost tropical vegetation has any appreciable effect on the insect life, and also whether there are any published records of entomological work done in the Scilly Isles. The few insects I met with can be got a few miles from London, but as I took no apparatus with me this does not count for much.—ARTHUR BLISS; 43, Lothbury, London, November 21, 1881.

[Consult the Rev. H. Harpur Crewe's paper, "Entomology at Tresco and the Scilly Isles" (Entom. x. 295–7; December, 1877), in which we read, "*Sphinx convolvuli* was common hovering over various flowers at dusk, but the specimens were all more or less battered." In Francis Walker's "Notes on the Insects of the Scilly Isles" (Entom. vi. 3, 52, 78), species of all orders but Lepidoptera and Coleoptera are referred to, and a detailed list of the Diptera and Hymenoptera (especially the *Chalcididæ*) captured, is given.—E. A. F.]

EULEPIA GRAMMICA.—This day I have had the pleasure to pin in my cabinet a veritable British specimen of *Eulepia grammica*. About two months ago I went over to Keighley, in Yorkshire, to see an old man that my late friend T. H. Allis used to call upon. His name is Jesse Miller, one of the older stamp of collectors, who collected for love; and, unless Labgry or Allis called, he had no correspondents, still less with any dealers. Allis tried hard to get the *Grammica*, but Jesse stuck to the moth. I asked him who took it, and he told me it fell off a tree-branch whilst "shakking boo's"—that is, shaking the boughs of trees for caterpillars. I now copy from his letter to-day:—"I send the moth you want, with thanks. It was taken in Wharfdale, about forty-six years ago, by a person of the name of John Armstrong, living at Addingham Low Mill, five miles from Keighley. You need have no fear of its being British, and it is the only one of the kind I ever saw." I may add that the specimen is old and perfect, but badly set, and much smaller and duller looking than any foreign specimen I have seen. It is a male.—J. B. HODGKINSON; 15, Spring Bank, Preston.

Abnormal appearance of Nola centonalis.—During the month of October, 1881, I bred a beautiful and varied series of *Nola centonalis*, and after trying several pairs at length succeeded in getting a very small batch of fertile eggs. I hardly expected to rear them at that abnormal season. The clover flowers were over, so on hatching I gave the larvæ the leaves of *Medicago lupulina*, on which they fed up pretty freely, and five of them spun up by December 16th, 1881. The first imago appeared to-day, January 23rd, 1882. The remainder of the brood I purposely checked by placing them in the out-door breeding house.—W. H. Tugwell; Greenwich, January 23, 1882.

Hyria auroraria bred.—During August last a friend very kindly sent me a worn female of the above species, with five eggs deposited in the box. In due course these eggs hatched; the young larvæ fed well upon knotgrass, and after a short time three of them showed signs of changing into the pupa state. This they did, and at the latter part of October I was pleased to see three imagos emerge of this beautiful insect. Is it not rather unusual for a double-brood of this species?—J. R. Wellman; 219, Elm Park, Brixton Rise, S.W., November 16, 1881.

Phigalia pilosaria.—On the evening of January 15th I captured a fine male specimen of *Phigalia pilosaria* in a most unlikely place. I found the insect on the hedge in Haxby Road, but a few yards from where I live; and it seems remarkable how it came to be there, as I know of no oak trees, where the larva would have fed, within a mile or more of where I took it. The very early appearance this year of *P. pilosaria* is interesting, as the first I saw last year was on March 20th.—Samuel Walker; 8, Neville Street, Haxby Road, York, January 17, 1882.

Eupithecia helveticaria.—I recently received some pupæ of *E. helveticaria* from larvæ collected on the Pentland Hills. From them, although kept in a cold room, I found one emerged on Christmas Day, and another to-day. Several other pupæ have changed colour, so that I expect others out in a short time. I have not had the species for some twenty years, when they came out of pupæ at intervals, from December 23rd to April 7th. These were also in a cold, earthenware jar.—E. G. Meek; 56, Brompton Road, S.W., January 5, 1882.

Aplecta herbida.—I was not aware that this species was double-brooded. During the month of July, I received from Sheffield eggs of this species, which hatched in due course. The young larvæ fed on knot-grass, on which I kept them until they disappeared in the earth to change into the pupa state. Up to the present time I have had eleven specimens emerge, all very dark green in colour.—J. R. Wellman; 219, Elm Park, Brixton Rise, S.W., November, 5, 1881.

Peronea hastiana.—On the morning of my leaving Deal, on the 20th of August last, while searching over the dwarf sallow on the sand-hills, I was pleased to find on the top shoots numbers of the larvæ of the above species, and have just had the pleasure of seeing some beautiful varieties emerge; out of nearly one hundred specimens, there are scarcely two alike.—J. R. Wellman; 219, Elm Park, Brixton Rise, S.W.

Xanthia gilvago, Aplecta occulta and Euperia fulvago at Doncaster.—I spent a few days with my friend, Mr. G. Tindall, at Doncaster. During September we sugared for *Xanthia gilvago*, which came sparingly to sugar, and we each took a nice series. I was much surprised on the 15th of that month to find a fine *Aplecta occulta* at sugar in a small plantation near that town. Mr. Tindall had taken two specimens the week before. He also took a worn specimen of *Euperia fulvago* at the same time.—W. Prest; 13, Holgate Road, York, October 16, 1881.

Scoparia conspicuata.—Early in August Mr. Hodgkinson let me see some of the new *Scopariæ* which he had discovered. Upon returning home I found in my collecting-box two specimens of the same genus, which I had taken a few days before near this city. I at once set them, and then forwarded them to be compared with Mr. Hodgkinson's specimens. They were found to be identical. I have since found two or three more in my store-boxes. I found them flying with *Scoparia truncicolalis*, and have no doubt we have been overlooking this new species for years. I got both males and females; the latter is very distinctly marked. —W. Prest; 13, Holgate Road, York, October 16, 1881.

Lepidoptera at Ivy Bloom.—Now that the ivy season is finished, I should be glad to know with what success other collectors have pursued their ivy investigations. Myself, I have been an assiduous attendant all through the season at the nocturnal assemblages on ivy, though with but indifferent success. I have found *Miselia oxyacanthæ* and *Cerastis vaccinii* in greatest profusion, and I have taken a fair number of *Orthosia lota* and *O. macilenta*, together with some individual specimens of *Xylina rhizolitha*, *Scopelosoma satellitia*, *Phlogophora meticulosa*, *Xanthia ferruginea*, *Anchocelis pistacina*; and of Geometræ, *Cidaria miata*, *Oporabia dilutata*, and *Cheimatobia brumata*. The moth which has most persistently refused to appear in anything like fair condition is *O. macilenta*, and *X. ferruginea* has been almost equally refractory. I can imagine no means of collecting so exciting as that afforded by ivy; there is not the trouble and discomfort, to my mind, always more or less accessory to sugaring. A sticky-pot, a brush with its handle drenched in treacle and rum, everything about you more or less sticky, and after all this the chance of no sport. Of course you may get nothing, and constantly do get nothing on ivy, but you do not feel so justly aggrieved in the case of ivy as in that of sugar. A small pair of steps, a lantern, and a store of glass-top boxes, and you are ready. Eagerly you scan the ivy blossoms. With regard to weather, I have found the most productive nights to be misty and dark, with a slight breeze. It is positively useless to examine ivy on moonlight nights, at least I have found it so. I do not know whether any real reason is assigned why ivy blossom should be so fatally attractive to moths; is it the irresistible influence of intoxication? I shall be glad to see in your interesting columns any explanation or reason as a solution why ivy should prove so manifest an attraction to the insect world.—C. W. Lubbock; Leesons, Chislehnrst, November, 1881.

Lepidoptera at Ivy.—Although an observer of insects for many years I never caught a moth at ivy-bloom till the middle of this month (November, 1881). The fine mild weather has tempted me to go, lantern in hand, during the last few nights; and although I have been able to spare but very little time my success has been very gratifying to me. I have caught, amongst others, the following:—*Xylina semibrunnea*, *X. petrificata*, *X. rhizolitha*, *Orthosia lota*, *Scopelosoma satellitia*, *Cidaria Psittacata*, *Phlogophora meticulosa*.—W. Macmillan; Castle Cary, Somerset, Nov., 1881.

Cerostoma asperella.—It is with pleasure I record the capture, in September last, of the above rare and lovely Tineina in its old haunt in this county. The last specimen seen here was in September, 1868, although the locality has been yearly worked.—[Mrs.] E. S. HUTCHINSON; Grantsfield, Leominster, Herefordshire.

DESCRIPTION OF THE LARVA OF PTEROPHORUS PTERODACTYLUS, *Linn.* (FUSCODACTYLUS, *Haw.*).—On the 13th of June last, Mr. W. H. B. Fletcher found, feeding on speedwell growing on a bank at Worthing, a good supply of larvæ of this species, which he at once kindly forwarded to me. It was, however, a late batch, for at the time Mr. Fletcher was breeding the moth freely from larvæ he had collected some weeks previously. Length about five-eighths of an inch, and scarcely so stout as seems usual in the genus. Head small, and narrower than the second segment; it is polished, rather flat in front, but rounded at the sides. Body cylindrical, of fairly uniform width, but tapering a little at the extremities; segmental divisions well defined; the skin, with a soft and half-transparent appearance, is sparingly clothed with short hairs. There are two varieties, which are perhaps about equally numerous. In one of them the ground colour is a bright grass-green; in the other it is equally bright yellow-green; in both forms the head is pale yellowish brown, very prettily reticulated with intense black. The dark green, or in some of the yellow specimens dark brown, alimentary canal forms the dorsal stripe; subdorsal lines rather indistinct, grayish white; below there is a still more indistinct waved line of the same colour; there is, again, a similarly coloured faint line along the spiracular region; and the segmental divisions also are of this pale colour. In some specimens the hairs are gray; in others brown. Ventral surface uniformly of the same colour as the ground of the dorsal area: the legs reticulated, and the prolegs tipped, with black. The pupa is attached by the tail only, is rather long, but slender. The head, which is the thickest part, is abruptly rounded, and has the snout very prominent; thorax and abdomen rounded above, rather flattened beneath, and attenuated strongly to the anal point; eye-, leg-, and wing-cases fairly prominent, the last prolonged a considerable distance over the abdominal segments. As in the larva, there are two varieties; in one form the ground is bright green, and there is little of any other colour, the pale gray abdominal divisions, and two indistinct pale lines on the dorsal area, with several faint purplish spots behind the thorax and on the anal segment, being all that are noticeable. The other form has the ground a dingier green, and there is a distinct purple dorsal stripe, edged on each side with grayish; the abdominal divisions and the tip of the prolonged wing-cases also purple. The pupa is capable of considerable movement, and, on being disturbed, turns up sharply the thorax and higher abdominal segments, so as to bring them quite at right angles with the several posterior segments. The first imago emerged on June 29th, and was quickly followed by a good series, which varied in size very much, some specimens being quite small. Two species of parasites also emerged, one of them an ichneumon with a long ovipositor, which Mr. Bridgman informs me seems new to Science.—GEO. T. PORRITT; Highroyd House, Huddersfield, January 2, 1882.

PEZOMACHI IN DEVON.—It may be interesting to some fellow-workers at the Parasitic Hymenoptera to notify a few captures of *Pezomachi* during the past year. *Pezomachus carnifex* I obtained by beating a whitethorn hedge at Exminster on the 3rd September, and again at Bickleigh on the 16th September. *P. rufulus* was common at Bickleigh on the 16th September. *P. corruptor.*—A single specimen, on the 20th August, at Bickleigh. *P. insidiosus.*—A single example, on the 6th September, at Bickleigh. *P. intermedius* and *P. incertus* were beaten out of a whitethorn hedge at Exminster, on the 3rd September: these two and the two following were recorded as British, in a paper read by Mr. Bridgman, before the Entomological Society of London, on the 6th April last. *P. Mülleri.*—A single specimen, on the 6th September, at Bickleigh. *P. nigritus.*—This I received from Liverpool from Mr. C. H. H. Walker, who bred it from galls formed on *Hieracium umbellatum;* without doubt it is parasitic on *Aulax hieracii,* the gall-maker. *P. oxylochophilus.*—This and the next species are now recorded for the first time as new to Britain. I obtained this species by beating whitethorn at Exminster, on the 3rd September. Mr. Bridgman has taken it at Norwich this year. *P. analis.*—This has also been taken by him for some time past, but not recorded from the difficulty of identification; it did not fall under my beating-stick until the 6th September last, and then at Bickleigh. *Hemimachus fasciatus* I obtained at Exminster on the 3rd September, and at Bickleigh on the 6th. *H. instabilis,* Först (*rufocinctus,* Gr.).—A single example, on the 16th September, at Bickleigh. Mr. Bridgman very kindly named the species of this most difficult group for me, the difficulty arising from the great variation in size and colour. —G. C. Bignell; Stonehouse, Devon, December 22, 1881.

[The handsome *Pezomachus oxylochophilus* has been taken by Mr. J. W. May, near the Raynes Park Station, Wimbledon, in September, 1878; by Mr. T. R. Billups, at Rainham, Essex, on July 11th, 1881; and by Mr. Bridgman, at Blundall, near Norwich.—E. A. F.]

Plagiodera armoraciæ, *L.*—I observe in the January number of the 'Entomologist' (Entom. xv. 23) that Mr. Theodore Wood, after referring to my letter, says that this beetle "may, possibly, be often passed over as the common *Phædon cochleariæ.*" I can hardly think that this is the case, as Mr. G. C. Champion, who would be very unlikely to make such a mistake, considered *P. armoraciæ* far from common; indeed he found very few. Those who have once seen *P. armoraciæ* gleaming under the bark of the willow would not confound it with any other beetle. I have never secured very many at one time; in fact, during the whole of one season I took but three; they were, however, more abundant this season. I rather agree with the Rev. W. W. Fowler's remarks as to the rarity of *Plagiodera*, in his paper on the genus *Phædon;* as, judging from the number of coleopterists who have been supplied with series from my captures, it would appear that, if not scarce, it is an extremely local insect. I have searched the willows in many places, but, with the exception of the one locality in Surrey from which I procure it, I have been unable to discover any traces of it.—G. A. Lewcock; 40, Oxford Road, Islington, N., January 14, 1882.

Description of the Larva of Lina longicollis.—At Abbot's Wood, near Eastbourne, in Sussex, I saw large numbers of this insect, the larvæ of which had devastated many of the young trees, eating the leaves completely to a skeleton condition. The following is a description of them:—White, with a blackish line in the centre, from the 3rd segment, becoming indistinct and interrupted after the 9th. On the 3rd and 4th segments are three black spots in the form of a triangle; on the 5th to 9th one larger spot on each side; on the 10th and 11th the spots coalesce; while the 12th and 13th are (on the upper side) entirely black. The 2nd segment is black margined with white, and with a faint whitish line and depression in the centre. Head and legs black; sides and under side white with black spots, the upper row of which forms protuberances. Length, 5 lines. The pupa is brownish yellow, marked much like the larva, and is suspended from the under side of the leaf.—T. L. Pennell; 14, Upperton Gardens, Eastbourne.

New Natural History Society.—Under the title of "North Middlesex Natural History Association," a new Society devoted to the study of Natural History, and the somewhat extensive work of forming "a Natural History Museum and Library for Reference," has been formed. The circular is dated from a temporary address in Holloway, so we may conclude that the more active efforts of its members to establish these institutions will be made in that neighbourhood of North Middlesex. We suppose in this great metropolis, with its four millons of people, there is plenty of room for many more new societies devoted to the same subject; but we imagine it might be better to concentrate our energies a little more on those already established, some of which would bear a little more organisation and development. —Ed.

NOTICE OF MAGAZINE.

The 'Union Jack Naturalist.' Edited by C. E. Kennedy, Liscard Park, Birkenhead, 1881–2.

This small magazine, which is devoted to all branches of Natural History, has reached its third number. It has been established chiefly as a reporter for the Union Jack Field Club, which, on enquiry, we find has some 220 branches, with an aggregate of 3000 members, composed principally of boys and young men. Beyond reports of meetings of the branches of this club, and other societies, are occasional articles, evidently written for young people or beginners in the study of natural-history field-work. This will be found a useful magazine for these young people, and will, doubtless, foster a desire amongst its readers for further knowledge on the subject. We wish Mr. Kennedy (who, by the way, introduces himself, on the cover of No. 1, as a "M.U.J.F.C.") every success with his little venture.—J. T. C.

NOTES FROM CURRENT ENTOMOLOGICAL LITERATURE.

Economic Entomology.—The 'American Naturalist' for January, 1882, contains, amongst the usual entomological notes edited by Professor C. V. Riley, an announcement that a State Congress of entomologists and fruit-growers was to be held in the senate-chamber, Sacramento, 6th and 7th December last, for the purpose of consultation and discussion as to the most practical means of exterminatiug the insect pests now infesting the orchards and gardens of the State of California.

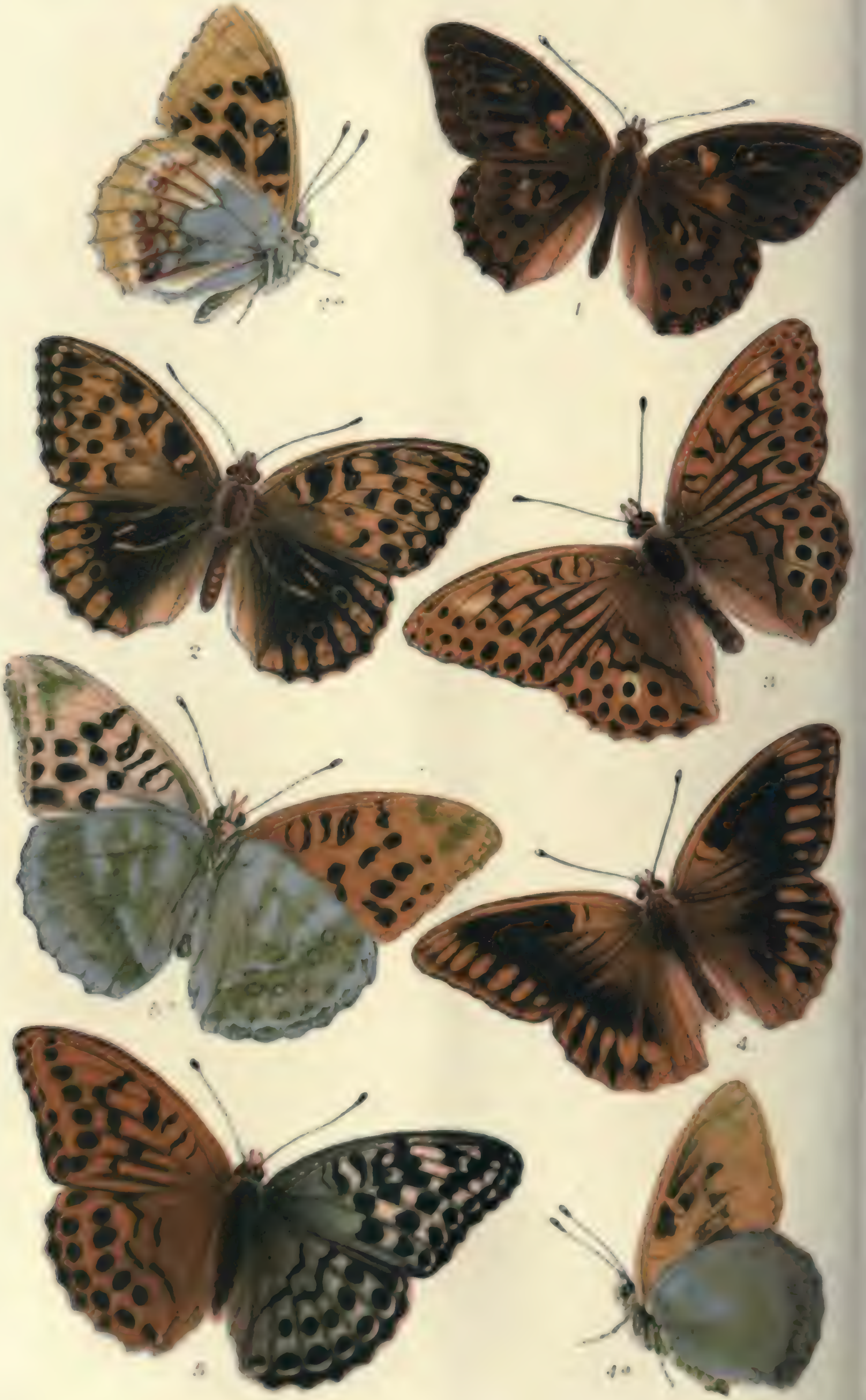
In the London 'Standard' of January, 18th appeared a leading article upon Miss Ormerod's work and report relative to the economic entomology of this country. This has been followed by several letters on the subject. Other London and provincial papers have also drawn the public attention to Miss Ormerod's work. Are we to have a State entomologist after all?

The Neuroptera of Madeira and the Canary Islands.—In the current journal of the Linnean Society appears a paper by Mr. Robert M'Lachlan, F.R.S., which forms an interesting contribution to the study of island life. Although the Coleoptera has been carefully studied by the late Messrs. Wollaston, Crotch and others, little systematic work had been hitherto done towards elucidating the natural history of the Neuroptera of those islands. The bases of this paper was a collection of Neuroptera, taken by the Rev. H. E. Eaton during the winter of 1880–1881. His stay in such of the islands visited by him was, however, of short duration. Madeira having but fourteen days devoted to it during the unfavourable month of November, nevertheless yielded twenty species, several of which were previously unknown. Six days in the Grand Canary, and one day only in the island of Palma, resulted during December in the capture of some eighteen species in that group of islands. Added to these the author finds in scattered papers references to other species. An analysis of all yet recorded shows "that 53 species are known from these islands; 37 are found in Madeira and 31 in the Canaries, 16 being common to both. Of these 53 species, 19 are known inhabitants of the continent of Europe and 5 others are doubtful in this respect, owing to imperfect identification. Four *Odonata* are African species not known to occur in Europe." Twenty-five species or thereabouts seem to be peculiar to the islands.

After some further remarks upon the probability of certain other genera being ultimately found in those islands, the author concludes by describing in detail the new species, and referring to those already known to Science.

J. T. C.

Entomologist March 1882. Plate 1.



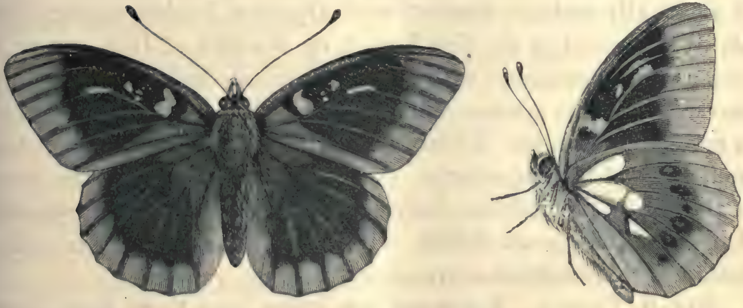
THE ENTOMOLOGIST.

Vol. XV.] MARCH, 1882. [No. 226.

ABERRATIONS IN THE GENUS *ARGYNNIS*.

By J. Jenner Weir, F.L.S., F.Z.S., &c.

(Plate I.)



Argynnis Adippe, *var.* of male.

The woodcut at the head of this article represents the upper and under sides of an aberration of *Argynnis Adippe* (male), captured near Salcombe, South Devon, last year, by Mr. A. W. Sture, of that town.

The specimen is a good example of partial melanism, accompanied by an almost total obliteration of markings; the red spot on the upper side, towards the base of the primaries, is very conspicuous. On the under side the silver spots towards the base of the secondaries are confluent, and those usually found in the middle and towards the edge of the wing are, with one exception, absent.

Fig. 1, Plate I., represents a partially-melanic aberration of *Argynnis Aglaia* (male), captured with another somewhat similar by Mr. P. H. Cooper, near Dover, about the middle of July, last year; the aberration is perfectly parallel on the upper side to that of *Argynnis Adippe* described above, even to the conspicuous red spot towards the base of the primaries.

Figs. 2 and 2 *a*, Plate I. In this aberration of *Argynnis Aglaia* (female) the melanism is almost confined to the upper side of the secondaries, but the under side of the same wings show—as in *Argynnis Adippe*, described above—an absence of silvery spots in the middle and margin of the wings, and at the base the spots become confluent in a silvery patch. The specimen was captured last year in the New Forest by Mr. Ashmede. I do not feel quite certain that the insect is not a hybrid between *Argynnis Aglaia* and *Argynnis Adippe;* the red spots on the under side of the secondaries are very much more apparent than usual in the former species.

Figs. 4 and 4 *a*, Plate I., represent the upper and under side of a partially-melanic aberration of *Argynnis Paphia*, captured by Mr. W. J. Argent in the New Forest, on the 12th of July, last year (see p. 52), in company with another similarly but not so strongly marked. In this specimen the partial melanism of all the wings is correlated with the obliteration of the silvery markings on the under side of the secondaries, except a pearly patch at the base of the wings, precisely as described above in the cases of *Argynnis Adippe* and *Argynnis Aglaia.* I am not able to offer an explanation of this singular correlation.

Fig. 3, Plate I. For some few years past there have been captured each season in the New Forest specimens of *Argynnis Paphia* (male) with a nearly white spot on each wing; that figured from the cabinet of Mr. Carrington was taken last year; I have taken four myself in 1879 and 1880, and in the same locality captured a similar aberration of *Argynnis Euphrosyne.* I feel quite unable to suggest any explanation of this singular aberration.

Figs. 5 and 5 *a*, Plate I., represent a specimen of *Argynnis Paphia*, both hermaphrodite and dimorphic, captured by Mr. Bernard Cooper in the New Forest on the 12th of July, last year; the left side is the normal form of the species in the male sex, and the right side is that of the dimorphic female coloration of the variety *Valezina.*

Whether there is any advantage to Nature derived from the existence of hermaphrodites it is impossible to say; but in the case of butterflies, where the male and female differ very much, they have often settled their specific identity, and still more in the case of dimorphism.

I have been an impatient listener to accounts of the quite different habits of *Argynnis Paphia* to those of *Argynnis Valezina.* In my younger days all seemed to think that the degradation of a so-called species into a variety was a positive injury to the value of a collection; but now a variety, local race, or even aberration of the commonest insect, is invested at once with both a scientific and an intrinsic value.

I trust I have written sufficient to show that some instruction may be gained from mere aberration, more from varieties, and still more from dimorphic forms; and, in conclusion, have to express my thanks to Messrs. Ashmede, Carrington, B. Cooper, J. H. Cooper, and Argent, for placing these valuable specimens in my hands for description.

6, Haddo Villas, Blackheath, London, S.E., February, 1882.

NOTES OF CAPTURES IN THE NEW FOREST.

By Wm. J. Argent.

At the risk of going over ground trodden by other correspondents in recent numbers of the 'Entomologist,' I venture to send a few notes of a fortnight's stay, made with my friend Mr. Bernard Cooper, at Lyndhurst, during the second and third weeks of July last. The weather, as many will remember, was hot and cloudless; being, in fact, one of those rare spells of real summer weather, with a heat almost tropical, and increasing every day in intensity, with which we are still occasionally favoured. For entomological purposes, at least, it was simply perfect; brilliant days being succeeded by nights equally acceptable to insect life.

As a result of the increased heat, nearly everything was a week or more in advance of its usual time of appearance. As early as the 13th the second brood of *Leucophasia Sinapis* was on the wing, and *Catocala promissa* made its first appearance at sugar; whilst a few days later *Gonepteryx Rhamni* was disporting itself among the hosts of *Limenitis Sibylla* and *Argynnis Paphia*, then past their prime.

Argynnis Paphia was, as has been observed, somewhat unusually abundant, but the proportion of its variety *Valezina* was far greater than I had observed it on any previous occasion. It was no unusual thing to see a dozen in the course of a morning's walk, or to come upon two at rest within a few inches of each other on a bramble or fern leaf. The depth of colour varies considerably in different specimens, from intense black to a shade of brown almost intermediate between the variety and the typical female. I was interested to learn from Mr. Tate that an entomologist known to him, who had obtained eggs from a *Valezina*, reared, out of eleven larvæ which survived to enter the pupa state, five *Valezina*; the remaining six being three typical females and three males. Thus (in this case) about 45 per cent. of the surviving progeny of a *Valezina* proved to be *Valezina*.

The remarkable dimorphic form, figured on Plate I. (figs. 5 and 5 *a*), was taken by Mr. Bernard Cooper in Park Ground Enclosure on July 12th; and the dark suffused variety of the male (figs. 4 and 4 *a*) was taken by myself on the same day in Brick Kilns, together with another similarly, though not so strongly, marked. In addition to these, a form of the male was not uncommon having a pale straw-coloured wedge-shaped mark on each of the upper, and sometimes also on the lower wings; and we each took one having the greater part of the under wings bleached after the manner of some of the New Forest forms of *Satyrus janira*.

Limenitis Sibylla was almost equally abundant. One I took was almost black, having a faint tracing only of the usual white markings.

Apatura iris.—Of this noble insect we saw a fair number, and spent many hours watching their majestic flight along the topmost branches of the oaks and firs. A series each adorned our setting boards before we left; one, a female, being given to the writer by the good-natured hostess of the 'Rose and Crown' at Brockenhurst, having settled on an outer door of that hostelry in the morning.

Boarmia roboraria was still common on the fir trunks, but somewhat out of condition. The variety *Conversaria* of *B. repandata* was not uncommon, but getting likewise slightly worn.

Lithosia quadra and *Liparis monacha* were common in the pupa state, but much affected by the attacks of ichneumons. The perfect insect of the former came freely to sugar, in company with hosts of *Leucania turca*, sundry *Triphæna fimbria*, and other commoners. *Cleora glabraria* larvæ had also been common. As is well known, most of the late ones are ichneumoned, but we took sufficient to breed a good series.

Triphæna subsequa.—Of this we took some four or five at sugar. It is easily distinguishable from *T. orbona* by the spot on the costa, by the size of the discoidal spots (which are larger and more distinct than in *Orbona*), and by its general appearance when at rest on the trees.

The principal excitement of the evening during the last few days of our stay was caused by the appearance in some numbers of those two handsome insects, *Catocala promissa* and *C. sponsa.* The first, *C. promissa*, appeared on the 13th July, and the species gradually increased in numbers from that time. *C. sponsa* came on the 19th, and was fully out by the 22nd, on which evening we boxed without difficulty some forty without the aid of a lantern; indeed by the time it was dark enough to light up, both "crimsons" had disappeared, and the tree trunks were almost deserted.

In the foregoing sketch I have referred only to the most noticeable species taken by us during one of the pleasantest of many holidays spent in the New Forest.

Wanstead, November 1, 1881.

OBSERVATIONS ON THE HABITS OF ANTS.*

By Sir John Lubbock, Bart., M.P., F.R.S., Pres. Linn. Soc.

Identification of Companions.

With reference to the interesting problem as to how ants recognize their companions, I have tried the following little experiment. It is of course well known, and has been abundantly proved by my experiments, that although if a strange ant is introduced into a community even of the same species, she is at once attacked. On the other hand, if a few ants belonging to different communities are placed together in a confined space, though at first a little shy, they gradually make friends. I thought, therefore, I would take a few specimens of *Formica fusca* from two different nests, which we will call nests A and B, place them together, and then, when they had lived together for some time, introduce the ants from nest A into nest B, and *vice versâ*. Accordingly, having first ascertained by direct experiment, though I had myself no doubt on the point, that the ants in nest A would attack and expel an ant from nest B, and *vice versâ*, I took two ants from nest A on the 2nd December, 1880, and put them in a small glass with two others from nest B.

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* Further Abstract of a Paper read before the Linnean Society, November 17th, 1881, continued (Entom. xiv. 282).

Then on the 23rd January, I put two of the ants from nest A into nest B. One of them was at once attacked; about the other we could not be sure. Unluckily the two ants from nest B were killed by an accident.

On February 24th, 1881, I again took three ants from nest A and the same number from nest B, and put them together in a small glass. Then on May 1st I put two ants from nest B into nest A. They were soon attacked very vigorously, and dragged out of the nest.

Thus, then, though these ants had lived amicably for some weeks with companions from another nest, they were not accepted as friends by the nest from which those companions were taken.

In consequence of Mr. M'Cook's suggestion, I took three specimens of *Lasius niger* and three of *Formica fusca*, and put them in water for an hour. After marking them, I put them back in the nest. The specimens of *L. niger* were put back at 11 a.m. They were quite amicably received, and the other ants began at once to lick off the paint with which they were marked. At 11.30 one was among the rest, evidently quite at home; the other I could not distinguish; but no ant was being attacked. At 12 the one was not quite cleaned; the other I could not distinguish. I looked from time to time during the afternoon, and certainly there was no fighting in the nest. The next morning I looked carefully, but there was no dead body, and I am satisfied they were amicably received.

The following morning at 7 a.m. I put in the three specimens of *F. fusca*. They were also evidently received as friends, and their companions began, as in the other case, to clean off the paint. At 7.30 they were quite at home among the others. 8, ditto. 9, ditto. 10, ditto. There could be no doubt about their recognition.

ON ANERGATES.

The life-history of the genus *Anergates* is, in the words of Forel, an unsolved enigma. The species was discovered by Schenck, who found a small community consisting of males, females, and workers, which he naturally supposed belonged to one species. Mayr, however, pointed out* that the workers were in fact workers of *Tetramorium cæspitum;* and it would appear that, while in *Strongylognathus* the workers are comparatively few, *Anergates* differs from all other ants in having no workers at all.† The males and females live with *Tetramorium cæspitum*, and are in several respects very peculiar—for instance, the male is wingless. One might consider it rather a case of parasitism than of slavery, but the difficulty is that in these mixed nests there are no males and females of *Tetramorium.* It seems quite clear that *Anergates* cannot procure its slaves, if such they are, by marauding expeditions like those of *Polyergus,* in the first place because they are too few, and secondly because they are too weak. The whole question is rendered still more difficult by the fact that neither Von Hagen‡ nor Forel found either larvæ or pupæ of *Tetramorium* in the mixed nests. The community consisted of males and females of *Anergates*, accompanied and tended by workers of *Tetramorium cæspitum.* The *Anergates* are absolutely dependent upon their slaves, and cannot even feed themselves. The whole problem is most puzzling and interesting. On the whole I would venture to suggest that the female *Anergates* makes her way into a nest of *Tetramorium* and in some manner contrives to assassinate their queen. It must be admitted that even this hypothesis does not fully account for the facts. Still, I have shown that a nest of ants may continue even in captivity for five years without a queen. If, therefore, the female of *Anergates* could by violence or poison destroy the queen of the *Tetramoriums,* we should in the following year have a community composed in the manner described by Von Hagen and Forel. This would naturally not have suggested itself to them, because if the life of an ant has, as was formerly supposed, been confined to a single season, it would of course have been out of the question; but as we now know that the life of ants is so much more prolonged than had been supposed, it is at least not an impossibility.

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* Europ. Formic.

† In *Tomognathus sublævis*, on the contrary, a Finland species, which lives in the nests of *Leplothorax muscorum and L. acervorum*, the workers only are known.

‡ Verh. des Natur. Vereins der preuss. Rheinlande und Westphalens. 1867, p. 53.

At any rate the four genera of so-called slave-making ants offer us every gradation from lawless violence to contemptible parasitism. *Formica sanguinea*, which may be assumed to have comparatively recently taken to slave-making, has not as yet been materially affected.

Polyergus, on the contrary, already illustrates the lowering tendency of slavery. They have lost their knowledge of art, their natural affection for their young, and even their instinct of feeding! They are, however, bold and powerful marauders.

In *Strongylognathus*, however, the enervating influence of slavery has gone further, and told even on the bodily strength. They are no longer able to capture their slaves in fair and open warfare. Still they retain a semblance of authority, and, when roused, will fight bravely, though in vain.

In *Anergates*, finally, we come to the last scene of this sad history. We may safely conclude that in distant times their ancestors lived, as so many ants do now, partly by hunting, partly on honey; that by degrees they becmae bold marauders, and gradually took to keeping slaves; that for a time they maintained their strength and agility, though losing by degrees their real independence, their arts, and even many of their instincts; that gradually even their bodily force dwindled away under the enervating influences to which they had subjected themselves, until they sank to their present degraded condition—weak in body and mind, few in numbers, and apparently nearly extinct,—the miserable representatives of far superior ancestors, maintaining a precarious existence as contemptible parasites of their former slaves.

It is conceivable that the *Tetramoriums* may have gradually become hardier and stronger; the marauding expeditions would then become less and less frequent. If, then, we suppose that the females found it possible to establish themselves in nests of *Tetramorium*, the present state of things would almost inevitably be by degrees established.

Thus we may explain the remarkable condition of *Strongylognathus*, armed with weapons which it is too weak to use, and endowed with instincts which it cannot exercise.

(To be continued.)

CHEIMATOBIA MYRICARIA, MIHI.

A GEOMETER NEW TO SCIENCE.

BY NICHOLAS COOKE.

ON the 27th January last I received from Mr. James Edmondson, of Keswick, three living pairs of a *Cheimatobia* which he informed me had just emerged from pupæ, and that he found the larvæ last summer, spun up in the leaves of sweet gale (*Myrica gale*).

The species is so much like *C. brumata* that I entertained some doubt about it being a distinct species; but he yesterday visited the spot where he found the larvæ, and captured five males (two just emerged) and one female on grass and posts near the sweet gale. I think this conclusively proves that the moth is quite distinct from *C. brumata*, as that species must have been quite over for a full month. I suggested that the warmth of the room in which the pupæ had been kept (there having been a fire in it most days since last August) had delayed their appearance, if they were *C. brumata*, as it was possible they had been waiting for cold weather; but he tells me he bred *C. brumata* in the same room, and that they emerged on the 5th November.

Dr. Staudinger gives only two species in the genus, so that it must be new to Science. I therefore propose the name *Cheimatobia myricaria*. The following is a description of—

Cheimatobia myricaria, mihi.

Expanse of wings fifteen-sixteenths to one inch and one-eighth. Fore wings brown, tending to purple, with several wavy darker transverse lines, and a darker central band; in some specimens the ciliæ are spotted with dark brown at the ends of the nervures. No central spot. The nervure in the middle of the wing forms a dark line where it passes through the dark band. Hind wings pale, with darker ciliæ. It is rougher looking than its nearest ally, *Cheimatobia brumata*, and rather smaller. The difference in colour between the two species is more striking on the under side. The female has the rudimentary wings grey, shorter than *C. brumata*, and in some cases without the dark band; its place in others indicated by a dark spot on each edge of the wing.

Larva on *Myrica gale*; makes its cocoon with grains of sand on the surface of the ground. Imago appears at the end of January.

Gorsey Hey, Liscard, near Birkenhead, February 8, 1882.

[I have not seen specimens of the moths referred to by Mr. Cooke, so cannot offer an opinion as to their distinctness; but *Cheimatobia brumata* has been observed in the Kentish woods at intervals during this abnormally mild winter, from October until the present time (February 20th), by my friend Mr. A. B. Farn. —J. T. C.]

THE TORTRICES OF NORTH DEVON.

By Richard South.

As addenda to my papers on collecting in North Devon, I will give a list of Tortrices met with in that locality last season:—

Halias prasinana was common in woods, flying just at dusk about the higher branches of oaks. I had never noticed before the peculiar buzzing noise made by this insect when flying, but I think I have previously heard of this stridulation. *Sarrothripa revayana*, a number bred from larva beaten out of oak. *Tortrix podana*, *T. sorbiana*, and *T. icterana*; the two former flying around oaks just before dusk or beaten out of ivy, and the latter flying along the rocks where the larvæ feed on the leaves of almost every plant growing thereon. In Middlesex and elsewhere, I have found this species in meadows, but in North Devon it seemed confined to the rocks; I did not observe a specimen in any stage in any of the fields or meadows. *T. Fosterana* was often beaten out of ivy, but *T. sylvestrana*, *T. roseana*, *T. heparana*, *T. unifasciana*, *T. viburnana*, *T. viridana*, and *T. ministrana* were met with but sparingly: this is curious, especially with regard to *T. viridana*. I was always under the impression that this insect was a pest everywhere in England.

Leptogramma literana, a number bred from larvæ beaten out of oaks. Among them were the forms *Romanana*, Fab.; *Asperana*, W. V.; *Irrorana*, Steph.; *Tricolorana*, Steph.; *Fulvomixtana*, Steph.; and a variety or two distinct from either of the known forms.

Dictyopteryx Lœflingiana, *D. Bergmanniana* and *D. Forskaleana*, *Argyrotoza Conwayana*, *Ptycholoma Lecheana*, *Penthina pruniana* were all scarce, but *Penthina cynosbana* was very common in every hedge. *Spilonota ocellana* was also fairly common, but I only obtained one example of *S. lariciana* among larch. *S. dealbana, S. neglectana, S. suffusana*, and *Pardia tripunctana* were only occasionally met with. *Sericoris littoralis* was common among its food-plant, *Statice armeria*; and *S. lacunana*, var., often captured in a wood close to the sea, but, strange to say, the ordinary form of the species did not occur in that wood, nor anywhere near, so far as I am aware, though *S. urticana* was abundant.

Cnephasia musculana and *Capua favillaceana* were both common; the last-named beaten out of heather in oak woods during the day, or found setting on tops of the same plants at night, after its short evening flight was over. This flight commenced about an hour before dusk, and continued until quite dark. *Phoxopteryx unguicana* sometimes met with on heaths, *P. uncana* was found in every wood where bilberry grew, and *P. Mitterbacheriana* occurred among oaks.

Grapholitha nigromaculana among ragwort, *G. campoliliana* among sallow, and *G. geminana* among bilberry, were all fairly common. *Hypermecia augustana* and *H. cruciana* occurred frequently among sallows. *Pœdisca corticana* was abundant; simply jarring an oak trunk with the foot would bring down a regular shower of *corticana*, with now and then *P. profundana*. *P. occultana* was met with in a larch plantation, and was fairly common.

Ephippiphora Pflugiana and *E. Brunnichiana* were plentiful. *E. turbidana*: the capture of this insect has already been mentioned (Entom. vol. xiv., p. 156). Three specimens of *E. tetragonana* and one solitary example of *E. obscurana* were met with; the last-named beaten out of oak into an umbrella, and boxed before he had realised his position. *Olindia ulmana* was captured now and then, usually met with in lanes.

Dicrorampha alpinana. The *Dicrorampha* referred to in Entom. vol. xiv., p. 159, must for the present stand as a local form of *alpinana;* I hope to be able to find the larva some day, and shall be greatly surprised if it does not exhibit some point of distinction when compared with the known larva of *alpinana*. I sent a specimen of the insect to Mr. C. G. Barrett, and he considered it a "very fine and strongly-marked *alpinana*." There is another *Dicrorampha*, which I found along the coast, and of which I submitted an example to Mr. Barrett, who says:—"I am unable to separate it from *tanacetana*, although, like your *alpinana*, it occurs where tansy certainly is not its food-plant . . . . and see no possibility of proving its distinctness." So it would appear that *D. tanacetana*, like its ally *alpinana*, does not confine itself to one particular species of food-plant, but can and does accommodate itself not only to allied species of plants, but even to allied genera, though after all there is not much difference in the properties of *Matricaria*, *Chrysanthemum*, and *Tanacetum*, each being more or less aromatic, and all tonic. *D. petiverana*, *D. plumbagana*, and *D. acuminatana* also occurred. The new *Dicrorampha*, figured in last year's volume, will shortly be described.

Trycheris mediana was sometimes captured in a garden, at rest on southernwood in the sunshine.

Lobesia reliquana; a few in woods. *Eupœcilia maculosana*, *E. angustana*, *E. rupicolana*, and *E. curvistrigana* were met with, but not commonly.

Xanthosetia Zoegana and *X. hamana* were common; so also were *Chrosis tesserana* and *Cochylis stramineana*.

12, Abbey Gardens, St. John's Wood, N.W., Jan. 16, 1882.

NATURAL LOCALITIES OF BRITISH COLEOPTERA.

By Rev. W. W. Fowler, M.A., F.L.S.

No. I.—INTRODUCTION.

As so many fresh students seem to be taking up the order Coleoptera, it has been thought that a few words as to the habitat, &c., of some of our British species might be of service to many readers of this journal.

Full particulars as to the anatomy of beetles, methods of collecting, setting, &c., are given in Rye's 'British Beetles,' which is by far the best book with which to begin the subject; but it may not be amiss, in an introductory chapter, to give a few useful hints on certain points.

As far as apparatus is concerned, the chief things wanted for ordinary work are a strong fern-trowel, a stout ring sweeping-net, and an umbrella. I used to find that the rings I bought at ordinary makers were quite useless for the rough sweeping necessary for Coleoptera. My nets were perpetually breaking; and there is nothing more annoying than to have one's net rendered utterly useless in the middle of a good day's work, as happened to myself one fine day in the New Forest. At last I got one made at a gunsmith's, which has never failed; it cost about three times as much as an ordinary net, but has saved its cost over and over again. The umbrella answers all the purposes of a beating-net, besides being convenient if it comes on to rain, while the butt end of the ring-net serves to beat with, so that by a little management one can beat and sweep over the same ground. The nets themselves should be furnished all round their upper edge with stout rings, and not with a turned-down edge of calico, as is the case with nets for Lepidoptera: by adopting these, the nets are saved from being worn out, and are easily run on and off the big rings, so that a water-net can in a very short time be substituted for a calico sweeping-net, or *vice versâ*. The fern-trowel acts as digger, stone-turner, and bark-ripper, and is indispensable where any dirty work has to be done. For wood work a miniature sort of pick-axe (axe one side and mattock the other) is necessary; Mr. Crotch, I believe, first designed this very useful tool.

The second great point on which coleopterists are always going wrong is the laurel for killing and preserving; very few seem to understand how to use it, and cannot keep beetles in it for a fortnight without their turning mouldy, much less for a year or two, as is very often done. The laurel must be gathered on a warm, sunny day, and the young leaves only must be used; they should be chopped fine, and put into quite air-tight bottles or tin boxes. The beetles should never be kept longer than three or four days (the more fragile ones only one day) in contact with the laurel, but should be picked out and put into muslin bags, and placed in store bottles half full of chopped laurel, which should be watched carefully to see that the laurel does not get damp or mouldy. Every week or so each bag should be opened, and the beetles thoroughly aired before being replaced. If these directions are followed, there will be little fear of mould; should it, however, make its appearance, it is easily removed either from unset or cabinet specimens by a mixture of one part of carbolic acid with ten or more parts of benzine. In winter, when strong laurel cannot be got, a little of this mixture on cotton-wool, put into the laurel collecting bottle, soon kills the beetles, which are afterwards relaxed by the laurel, even if it be weak, although, of course, it takes a longer time. The smaller *Staphylinidæ*, *Trichopterygidæ*, &c., should always be collected into small bottles of spirits of wine and water (about half and half); if soon set they come out beautifully, retaining all their pubescence, which else is very easily rubbed off.

The harder beetles should never be put into spirit, as there are very few of them that can be set satisfactorily afterwards, nor should any of the species of *Staphylinidæ* with scarlet elytra, as it spoils their colour entirely. A little experience, however, will soon teach the uses both of laurel and spirit. If the collector has time to set the beetles as soon as captured, by far the best plan for killing all species, without exception, is by throwing boiling water over them. This kills them instantaneously, so that even those species which most quickly withdraw their antennæ and legs into deep recesses have no time to do so, and are therefore much more easily set. They should not be thrown into the water, as, in the act of falling, many species will spread their wings, and be rendered useless as cabinet specimens.

A few words, perhaps, as to the actual setting may not be out of place: the insect should be laid on its back, and its limbs carefully brushed out with a hard blunt brush—an ordinary fine brush cut back some way is the best implement; it should then be taken up by a fine, though hard, pointed brush, and laid on card on which some gum has been spread, and its limbs brushed into place. If refractory, the limbs may be easily put in position by means of a needle or a bent pin, which last is very useful for drawing out such limbs as may have retreated under the body. Many beetles, especially minute ones, such as *Scydmænidæ*, *Lathridiidæ*, *Halticidæ*, &c., may be almost entirely set with the needle, without any brushing out, but species of other families, such as *Curculionidæ*, *Histeridæ*, *Byrrhidæ*, &c., require to be most carefully brushed out before being placed in position. The pinion feathers of snipe or woodcock are exceedingly good brushes for the smaller species, as they are hard, and come to a very fine point: Mr. Matthews, whose experience in the smaller insects is greater than any living entomologist, has, I believe, used these feathers for the whole of his *Trichopterygidæ.* The *Staphylinidæ* are perhaps the most aggravating, as, in the first place, owing to the formation of their anterior coxæ, they are very hard to set flat, and it is the *sine quâ non* of all setting of beetles that they should be straight and flat on the card; and, even if this be overcome, they have a habit of curling up, the segments of the abdomen all telescoping and rendering the insect an unsightly object generally: if, however, the anterior legs be drawn backwards instead of forwards (and they look just as well), and if an extra supply of gum tragacanth or a little pure gum arabic be placed under the tail, both these disadvantages will be avoided; a card brace for the abdomen is also a perfect remedy for contraction.

The gum, as just mentioned, should be gum tragacanth, but two or three lumps of gum arabic should always be added, and a little carbolic acid or spirit to preserve it from decomposition, which soon sets in otherwise.

The card should not be smooth, but rather roughened on the surface: a thick post-card is an excellent type of card for general setting, and as it is to be obtained at all country post-offices it may come in very useful in out-of-the-way places, as an innumerable quantity of beetles may be set on one such card, if cut up into small strips.

The pins used should not be too thick or too long, and the beetles should not be raised more than half an inch up them; if they are raised very high, as is the custom in some collections, they are much more apt to jerk off the card when removed from one box to another.

It is perhaps waste of time to set all the minute species correctly; but unless they are set flat, with the antennæ and one anterior leg at least fully showing, they are in many cases utterly useless: it is almost impossible to name many of the *Meligethes*, *Saprini*, &c., without these parts being clearly displayed, the distinctive characters not only of species but of genera depending entirely upon them.

The localities in which Coleoptera may be found, and various methods for their capture, will be mentioned in forthcoming papers; but there are two points that well deserve consideration, which are considered essential with lepidopterists, but are almost entirely neglected by coleopterists, and these are breeding and sugaring. The life-histories of very few beetles are known, and will well repay study. The larvæ of many species, especially the wood beetles, are easily obtained; from a few bored twigs, casually picked up last January under some fir trees, I bred in June *Tomicus bispinus*, *Lissodema 4-pustulata*, and hundreds of *Pityophthorus micrographus*, and the very rare *Tropideres sepicola* has, I believe, never been obtained in any other way. As to sugaring, it is well known that the larger *Carabidæ* come to sugar, but it is not generally known that if a little moss be sugared and put into a hole in the ground, or in a hole in a tree, it will often produce very rare species of the smaller insects.

In conclusion, it may be said that there is yet a wide field open to discovery as far as Coleoptera are concerned, and any coleopterist may soon make a name for himself by the discovery of *Adelops* in our many bone caves, of *Anillus* under the Snowdon boulders, or of *Langelandia* in buried logs of wood in any part of the country.

I would only add that it is almost impossible to collect Lepidoptera and Coleoptera together with any comfort: as, however, it is very annoying to miss some rare species, a brass Y and folding sugaring-net may be carried in the pocket, and the sweeping-net will usually suffice to hold the insect until the gauze net is got ready to receive it.

The School House, Lincoln, January 5, 1882.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Rhopalocera at Llandudno. — As a supplement to Mr. Porritt's note in the September number (Entom. xiv. 215), the following particulars as to the butterflies of Llandudno may be worth recording:—*Gonepteryx rhamni* is not often met with; *Colias Edusa*, which is rare this season, was taken in large numbers at Colwyn Bay in 1877, and *C. Hyale* is to be found on the banks of the River Conway. Of the whites, *Pieris brassicæ* is oftenest seen. *Vanessidæ* are well represented; *Vanessa cardui* was very common in 1880, but I did not see one this year. *Vanessa Io* and *V. Atalanta* rival *V. urticæ* in numbers, while *V. polychloros* is not rare on the Great Orme. *Vanessa C-album* makes the Gloddaeth Woods its head-quarters, occurring plentifully, where also *Argynnis*

Aglaia and *A. Adippe* are found together. *A. Paphia* is scarce, but *A. Selene* and *A. Euphrosyne* the reverse. A lane leading to Gloddaeth is a noted locality for *Nemeobius Lucina. Thecla quercus* is common, but I have only taken one specimen of *T. W-album. T. rubi* is plentiful near Llandudno Junction. Of the blues, *Lycæna Alsus* is very common in the woods, where *Anthocharis cardamines* and *Satyrus Egeria* literally swarm each spring. I have seen *Lycæna Argiolus* in profusion flying over the ivy on Conway Castle, and last year took a long series of *L. Agestis* on the Great Orme. *Thanaos Tages, Hesperia sylvanus,* and *H. linea* occur on the sand-hills, where I have also taken some very large specimens of *Polyommatus Phlæas.* Of all the butterflies *Satyrus Semele* is the commonest, being met with everywhere in extraordinary numbers every season. I was unfortunate as to weather this year, for, although fine, it was very dull, only getting three bright days in three weeks, from July 29th to August 19th; while last year the first fortnight in September was far more favourable for collecting, the latter being the month I should recommend for a visit to this splendid watering-place, as all insects are later on the wing than inland.—Martin J. Harding; Murivance, Shrewsbury, Nov. 7, 1881.

Argynnis Paphia *var.* Valezina.—In a former number a correspondent inquires whether *Valezina* has been taken coupled with *A. Paphia.* I once took such a pair at Fontainebleau. Prof. Frey, of Zurich, records the same. I may add that this year I took a pair of black *Xylophasia polyodon* in cop., showing that in this case the melanism is not confined to one sex.—Wm. F. de V. Kane; Kingstown, Ireland, Feb. 10, 1882.

The effect of Heat upon Notodonta dictæa.—That artificial heat should materially affect the usual time of occurrence of Lepidoptera is not at all surprising; but that the season being a little milder or colder than usual should decidedly alter the normal times of appearance is certainly interesting. For nstance, I took *Nonagria lutosa* in fine condition so late as November 10th, while five days later *Phigalia pilosaria* was on the wing. Again, the first week in the present January, *Hybernia eucophearia* could be seen both in a fresh and worn state, ndicating that it had been a witness to the coming in of the new year. But my present object is to offer a few remarks with reference to the great heat of last summer in breeding *Notodonta dictæa*. Having taken and watched the life-history of this species for several seasons, I have observed that warmth is indispensable to the successful rearing of the insect; hence I fully hoped that the warm weather of August and September, 1880, would produce a good spring brood in 1881. That wish was realised, for I easily took two or three each evening during the latter part of last May, from which were obtained a plentiful supply of eggs. From these emerged 140 larvæ, which in a few days were "sleeved" out on *Populus dilatata*. The rapid manner in which they grew during the great heat of the 3rd, 4th and 5th of July was very conspicuous. Upon the last-named date the thermometer was 92½° in the shade, but on the 6th it fell to 56°. This sudden change caused an equally sudden result upon the larvæ, for in the evening I found, to my regret, that six were dead, and the remainder in a semi-torpid state; to arouse them it was quite essential to place them at no great distance from a fire. By the 11th the temperature was again high, and the *N. dictæa* once more in a thriving condition. The next instance worthy of note occurred on the 15th; here it will be remembered that this was the hottest day on record in this country, and, as I have since found out, too hot for success in procuring perfect imagines of this species, as the following facts will show. On the evening of the 14th all the larvæ were feeding; but on looking in the breeding cage twenty-four hours later there were actually seventeen changed to pupæ, and lying wholly exposed on the surface of the mould. These ultimately produced fifteen deformed, and only two perfect, specimens. After July 16th the temperature did not exceed 89° in the shade, a maximum which was registered for the three succeeding days. This period was long enough to enable about 100 to pupate, nearly all of which followed the usual rule of forming a subterranean cocoon, and in due time, with few exceptions, yielded fine imagines. The first moth appeared on July 25th, and the last on September 6th. There are two pupæ left, which are alive and passing the winter in that state. In conclusion I may add that to secure *N. dictæa* in proper condition it was necessary to arouse oneself between the small hours of 2 and 3 a.m., as the great majority persisted with the utmost regularity in emerging from 12 to 12.30 p.m. Now to kill them at once was out of the question, and to leave them to enjoy the length of time essential for rest in order to resuscitate the energies of man, simply meant utter ruin to the moths.—H. T. Dobson, jun.; New Malden, Surrey, January 14, 1882.

Re-occurrence of Eupithecia extensaria.—At page 108 of vol. viii. of the 'Entomologist' is recorded the capture of a single specimen of *Eupithecia extensaria*, which was then added to the British list of Lepidoptera. Again, in the same volume, pp. 132 and 133, are further remarks upon this species, which was then considered, even by its captor, as possibly introduced into this country by some of the steamers trading between Hull and Russia. It is highly satisfactory to find—again through its first discoverer, Mr. William Prest, of York—that this species has been taken in another part of Holderness, and many miles from the first locality of its capture. The particulars as given by Mr. Prest are as follows:—"In looking over some boxes belonging to Mr. James Buck, one of the oldest collectors in Hull, I espied an insect which seemed familiar to me. On closer examination I found it to be a male specimen of *Eupithecia extensaria*. Mr. Buck told me that he well remembered taking it about ten years ago, while it was sitting on wormwood (*Artemisia*), at Spurn Point, in Yorkshire. He and several others had been there for tern's eggs, and in coming home he saw the moth at rest. Having no collecting-boxes with him, he brought it home in his tobacco-box. Mr. Buck kindly gave me the specimen which is now in my collection." On such evidence as this one would think the Hull entomologists should now turn up this species, which appears equally rare on the Continent and in this country.—John T. Carrington; February, 1882.

Early Lepidoptera.—While examining the trees in Richmond Park, Surrey, on January 29th, I found imagines of the following species:—*Nyssia hispidaria*, *Phigalia pilosaria*, *Hybernia leucophearia*, *H. progemmaria*, *Anisopteryx æscularia*, and *Tortricodes hyemana*. I never remember during my long experience as a lepidopterist taking so many species on one day so early in the year.—E. G. Meek; 56, Brompton Road, S.W., January 30, 1882.

Nyssia hispidaria.—On the 12th of February I and my friend Mr. Franklin took seven specimens of the above insect in Richmond Park, and saw several others taken, showing, although somewhat early, that the species was fairly out. *Hybernia leucophearia*, *Anisopteryx æscularia*, and *Phigalia pilosaria* were also well represented.—W. J. Harper; 66, Mansfield Street, Kingsland Road, February 18, 1882.

Anerastia Farrella.—I note that Mr. Edward A. Atmore, in a contemporary, records the re-discovery of *Anerastia Farrella*. This should scarcely be called a re-discovery, because it has been taken many times since 1844 (the date mentioned as that when the late Mr. Farr left Norfolk) by Mr. Thomas Brown, of Cambridge, on the sand-hills near Yarmouth, while searching for *Crambus fascelinellus*. The first of Mr. Brown's specimens occurred about 1870. These specimens passed through my hands, and are now distributed among various collections in this country.—E. G. Meek; 56, Brompton Road, S.W., February 2, 1882.

Cedestis Gysselinella in England.—It may interest your readers to know that I have a specimen of this rare species taken in Kent, and also a specimen in Norfolk, which were captured by the Rev. H. Williams last season, and given to me. When I called his attention to it he wrote me he had taken another, but did not know its importance. Both of the specimens are larger than a specimen Mr. Dunsmore sent to me, which he took near Paisley some years ago. When placed beside *C. farinatella* it may readily be detected by the facial band being brown. It is also a larger insect, and not as chubby looking.—J. B. Hodgkinson; Preston, February 9, 1882.

Lepidoptera near Marlborough.—The year 1881 was an unusually favourable one for the entomological members of our Natural History Society. Among the butterflies caught, *Apatura Iris*, *Lycæna Alsus*, *Melitæa Artemis* and *Nemeobius Lucina* deserve special mention. Among the moths we can record the capture of *Stauropus fagi*, *Procris Geryon*, *P. statices*, *Nemeophila plantaginis*, *Euthemonia russula*, *Geometra papilionaria*, and *Iodis vernaria*. Seven new species have been added to our list, four of them *Eupitheciæ*, of which *E. irriguata* and *E. consignata* are rare. It is a curious fact that most of the insects above mentioned, especially *L. Alsus*, *M. Artemis*, *N. Lucina*, *P. statices* and *G. papilionaria* turned up abundantly last year, after being seemingly extinct for several years previously. The time of their appearance was very limited, five days being the period during which *M. Artemis* was found, and all the specimens of *G. papilionaria* (seven in number) were taken in less than that time. Is there any special reason for their sudden reappearance and short existence? Our sugaring was hardly so successful as usual;

perhaps unfortunate nights were chosen, and we can record the capture of no rare or local Noctuæ.—P. H. Maddock; Marlboro' College, January 22, 1882.

Lepidoptera at Ivy in Ireland.—I may perhaps supplement the recent notices of captures at ivy bloom by the following notes of insects taken on this side of the Irish Channel during the autumn. In September I hardly took any insects at sugar in Lord Howth's demesne—a locality which I expected would have proved prolific of valuable insects. Any I took were at light—namely, *Ennomos erosaria, Epunda lichenea, Eubolia cervinaria, luperina, testacea,* and *Hydræcia micacea.* The magnificent crop of yew berries proved equally unattractive, only a couple of *Phlogophora meticulosa* having been seen. In October, however, *Xanthia ferruginea* and *Miselia oxyacanthæ* came freely to sugar and light, and near Kingstown at ivy later on in the month; and in November I took the following—one *Agrotis saucia,* a few *Xylina rhizolitha, Cidaria miata,* and *C. psittacata; Anchocelis pistacina* and *Xylina petrificata* more abundantly; while *X. ferruginea* and *P. meticulosa* were exceedingly numerous; and not less so *M. oxyacanthæ,* but the latter seems to be attracted rather by light than ivy; *Scopelosoma satellitia* was also very common, and *Calocampa vetusta* not rare. *C. exoleta* seems not to occur in the neighbourhood; while neither *Orthosia macilenta, O. lota, Anchocelis rufina, A. litura,* nor *Cerastis vaccinii* put in an appearance. *Cheimatobia brumata* abounded in the hedges in November. During the summer I took *Stilbia anomala* on cliffs by the sea, or pastures beside the shore. I sought unsuccessfully for it in Howth Castle demesne, where the larva should occur if Newman's description of its favourite haunts is correct, namely, "open parts of woods." It would be interesting to know whether my observations can be confirmed by those who have taken this insect in other localities, in the South of England or at Kinloch Rannoch, in Scotland. One of my specimens is of a deep blue-black on the fore wings.—Wm. F. de V. Kane; Kingstown, Ireland, February 10, 1882.

Entomological Evening at the Royal Aquarium.—At the "Entomological Evening," held at the Royal Aquarium, on Monday, February 6th, about forty gentlemen attended. The more interesting exhibits included a new *Coleophora* from Wicken Fen, also fine series of *Eupithecia Helveticaria;* the former taken last June, and the latter recently reared by Mr. Meek. Mr. G. Elisha brought for exhibition *Polia chi*, varieties *olivacea* and others intermediate between that and the type; perfectly black *Eupithecia rectangulata;* also melanic *Diurnea fagella.* Mr. Cooper, a very fine series of varieties of *Hybernia defoliaria*, taken by himself near London. Mr. Machin showed a box of rare Lepidoptera, including *Phycis adelphella*, *Eupœcilia ambiguana*, *Argyrolepia maritimana*, and *Lemnatophila salicella.* Mr. T. A. Clark, a series of remarkably large *Eupithecia expallidata.* Mr. Jones, preserved and living larvæ of lepidopterous insects. Mr. South brought an exceedingly interesting box of the *Pterophoridæ* from North Devon and elsewhere: among them were examples of those recently described in this magazine; the distinctness of his new species, *Amblyptilia tæniadactylus*, as compared with *Platyptilia Zetterstedtii*, was noted. Mr. G. Clark sent for exhibition a beautiful series of the rare *Crymodes exulis*, taken by him last summer in Invernesshire: they were remarkable for the uniformity of type which characterises Scotch examples of this moth, when compared with the very variable form occurring in Iceland.—J. T. C.

PULEX FEEDING ON LEPIDOPTEROUS LARVÆ.—Some time ago I visited a seed warehouse, and, seeing a number of larvæ feeding on some peas, I took a quantity of them home to examine. I detected amongst them the larvæ of *Œcophora pseudospretella* and *Endrosis fenestrella.* Another larva was there which I could not make out. A short time ago, however, the question was solved by the emergence of a number of fleas, apparently *Pulex irritans.* On closely examining them I found the stomach fluids quite transparent, and not red in colour, as when the lively little torments have fed upon mankind. This fact led me to watch them more closely, with the result that I found them feeding liberally on the juices of the above-mentioned lepidopterous larvæ. I gathered some consolation on seeing my lively little friends feeding on two species of larvæ, which frequently cause us lepidopterists so much annoyance by in turn feeding on our carefully stored pupæ. I should mention that those larvæ which had been attacked by the fleas appeared to pine away and die. I had nothing but peas, fleas, and larvæ in the gallipot, covered with plate-glass, through which I observed this economy of nature.—CHAS. J. BODEN; 153, Snows Fields, S.E., February 15, 1881.

Lancashire and Cheshire Entomological Society.—The annual meeting of this vigorous Society was held in a lecture-room at the Free Library, Liverpool, on the 30th January, the president, Mr. S. J. Capper, in the chair. After re-election to that office for the sixth time, Mr. Capper gave an interesting *résumé* of the history and work done by the Society since its foundation early in 1877. Since that period fifty-six meetings had been held, at which fifty-one papers had been read, forty-five of which had been contributed by its own members, which now number about sixty. A circulating library of entomological works has been formed, with a goodly number of volumes, and more pleasing still is it to find how largely it has been used. Much praise is due to the officers, whose energy has brought about this desirable condition.—J. T. C.

OBITUARY.

Robert W. Sinclair.—This high-spirited and energetic young entomologist died January 28th, somewhat unexpectedly, of acute pneumonia, at Sir Patrick Dunn's Hospital, Dublin. Mr. Sinclair, whose age was but twenty-two years, was the son of the late Robert S. Sinclair, LL.D., Minister of Public Instruction in the Province of Berar, India. Sad as it is at all times to part with an ardent lover of Nature, it seems doubly so when it is he who only a few weeks ago was pleasantly chatting with us, and apparently promising so much in after life. At the funeral of Mr. Sinclair, which was largely attended by his fellow-students of Trinity College, Dublin, Professor Houghton, in an address given at the grave, having paid a high tribute to the deceased's father, added, "and his son, whose early death we now deplore, bid fair to outshine him." Only a few days before his death the Royal Hibernian Academy gave him a grant to enable him to continue his entomological researches during the coming season. Mr. Sinclair was intended for the medical profession, and had but one examination to pass before completing his college course.—J. T. C.

J. W. Jobson.—It is with regret we have to announce the early death of this young collector, so well known for his energetic work in the New Forest, &c. Mr. Jobson fell a victim to our national disease—consumption—at the age of twenty-one years. He died at his father's house, Leyton, on the 10th February.—J. T. C.

NOTES FROM CURRENT ENTOMOLOGICAL LITERATURE.

Economic Entomology.—The Report of the Judges on the Derby Prize-Farm Competition, 1881, has been issued in the 'Journal of the Royal Agricultural Society of England,' vol. xxxvii., part ii. In this report will be found many interesting references to destructive insects amongst farm crops. Those most attacked were oats by *Oscinis vastator*, Curt.: of this it is said (p. 467)—"Insect life was very active this spring, despite the severity of the winter. A tiresome tiny maggot attacked the stem of the oats soon after it was above ground, and, penetrating its inner case, cut off the shoot which should have produced the ear. The plant for a time looked dead, but subsequently made an effort to recover itself and put forth a number of minute faint stems many of which produced a diminutive ear. The result of the attacks of this insect had a most damaging effect upon the oat-crop." The mangold-wurzel fly (*Anthomyia betæ*) is repeatedly referred to by the Judges as more or less destructive (pp. 467, 481, 493, 510, 524, and 530). Various remedies against this pest are suggested (p. 468), chiefly with a view to stimulating the plant so as to enable it to outgrow the attack of the larvæ of *A. betæ*. Amongst these remedies were "guano, nitrate of soda, and mineral phosphate," the latter being said to be best. Soot is also mentioned as of advantage. We are very glad, however, to note that the most successful remedy appears to be the encouragement of small birds. At page 481 the report says—"In Mr. Bryer's fields and in others we have noticed flocks of little birds, mostly sparrows and chaffinches, that were feeding on the insects. So well had they done their work at Markeaton Park, that we had some difficulty in finding a maggot in the leaves; the vesicle had been torn open and the maggot removed, let us hope into safe custody." Reference is made (p. 530) to the turnip beetle, *Phyllotreta nemorum*, Linn., which seems in this instance to have been cured in the following manner—"by drawing over them elder boughs, horse-hoeing with elder boughs tied to the sides of the horse-hoe, rolling, sprinkling with diluted paraffin, and finally with fresh-slaked lime." It is not suggested which remedy proved most effectual, probably the paraffin, for in "Through the Light Continent" (p. 58) Mr. Saunders mentions that remedy as most generally used with success in Colorado, against-potato bugs and grasshoppers.

Sericiculture.—In the 'Journal of Science' for February, Mr. J. W. Slater reviews the "Handbook of the Collection illustrative of the Wild Silks of India in the India Museum," by Thomas Wardle. Mr. Slater makes some pertinent remarks which are worthy of perusal by those interested in the production of silk, whether from a commercial or natural-history point of view.

Ichneumon Parasites of Butterflies.—Mr. A. S. Packard, in 'Proceedings of the Boston Soc. of Nat. Hist.,' vol. xxi., part i. (published November, 1881), gives descriptions of some new Ichneumon parasites of North-American Butterflies. In this paper Mr. Packard refers to some score species, most of which he has described as new to Science.

Ichneumonidæ of Devonshire.—Mr. Ed. Parfitt, in 'Report and Transac. of Devon. Assoc.,' 1881, p. 241, contributes to the fauna of that county a list of ichneumons observed therein. The list, with introductory notes, occupies upwards of fifty pages, and will be found useful to students of that order. J. T. C.

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ON THE DISEASES OF LEPIDOPTEROUS LARVÆ.

By A. B. Farn.

Having been looking through the manuscript of a translation which I made some years ago of M. Pasteur's masterly work on 'Diseases of Silkworms,' I thought that parts of it might have some practical bearing on the rearing of lepidopterous larvæ generally, and I accordingly send for publication the following hints on the disease with which, it appears to me, lepidopterists are most concerned.

M. Pasteur attributes the disasters which, for the last twenty or more years, have attended commercial silkworm-rearing, to two principal diseases, namely, to "*pébrine*," or spotted disease, and to "*flacherie*." To sericulturists the former of these diseases is of the greater importance, while to rearers of our indigenous larvæ the latter appears to be the greater evil.

Pébrine is not only a contagious, but essentially an hereditary, disease, and (as will be readily understood) entails great loss where the same species has to be reared for an indefinite number of generations, and where, as in the case of the silk-moth, wild specimens cannot be taken to deposit eggs for fresh rearings. Those entomologists who rear specimens from the eggs for their collections do so for a few generations at most, and start again from time to time with eggs from wild specimens; thus almost, if not entirely, avoiding a disease which becomes more formidable to each successive generation. *Flacherie*, although it may be hereditary, may on the other hand be suddenly developed in a brood of larvæ, and kill every individual;

and for these reasons it is the disease which most affects us. *Flacherie* is most fatal just as larvæ are arriving at maturity. The larvæ have apparently fed up well, and although there have been a few deaths they have not been sufficiently numerous to cause serious alarm and have been attributed generally to diarrhœa. When nearly full fed, and in appearance healthy, they are so feeble that their movements are scarcely perceptible; they stretch themselves out on their food-plant or on the top or sides of the rearing-cage, and remain without moving till they die, frequently hanging down supported only by some of their claspers. In these positions they sooner or later become flaccid, sometimes this takes place in a very short time, and they putrefy and turn black in twenty-four hours, the skins being filled by decomposing fluid—being "moist unpleasant bodies," as Mr. Mantalini would have remarked. It is said that, if a silkworm rearing-house (*magnanerie*) is entered when the worms are dying of *flacherie*, a sour disagreeable odour is perceptible, due to volatile fatty acids formed by the fermentation of the matter contained in the intestinal canals, and which is given off by the worms. Death is due to the derangement of the digestive functions supervening on the fermentation above mentioned; and it would appear that the disease may be communicated to healthy larvæ by soiling their food with the fermenting matter from the intestinal canal.

Flacherie is due to overcrowding of larvæ, to undue moisture in the atmosphere, to too-succulent food or to food given when very damp, or to defective aëration of the breeding-cages. Some of these causes may develop fatal effects within twenty-four hours; others simply weaken the larvæ, and sow the seeds of disease which will afterwards decimate the brood. Larvæ do not urinate, and the large amount of moisture they as a rule take in with their food has in great measure to be got rid of by transpiration; anything, therefore, which checks this transpiration is injurious.

If a few large larvæ with their food be placed in a perfectly-closed vessel, they will in a very short space of time be covered by moisture which they have transpired, and which there has been no current of air to carry off. Internal-feeding larvæ, even under natural conditions, seem very liable to die of this disease. I have frequently noticed larvæ of the genus *Sesia* dead of it, as also those of the genus *Nonagria*—larvæ, in fact, feeding in a stagnant, moist atmosphere.

A dry atmosphere and a good current of air are essential to the well-being of larvæ; and, on the other hand, it is necessary that the food should be free from external moisture, such as rain, mist, dew, &c., and not of too young or luxuriant growth. If watery ejections are noticed in the rearing-cage, be sure that there is at least a stagnation of air; and nothing is more fatal to the health of larvæ than a moist and stagnant atmosphere. A vessel containing quick-lime might be placed in the rearing-cage with advantage, the larvæ of course being prevented from contact with the lime, which will absorb much of the humidity in the cage.

Greater success is likely to attend the rearing of small batches of larvæ than when many are placed together. Where possible, larvæ, I find, do best when confined in gauze bags on their food-plants; if they are thus bagged on branches, care should be taken that, however high the wind may be, the branch will swing free of all obstructions. In wet weather the larvæ should, if fed up in cages, be placed in a room where there is a current of air—in front of an empty fireplace, for instance.

The Dartons, Dartford, March 9, 1882.

NATURAL LOCALITIES OF BRITISH COLEOPTERA.

By Rev. W. W. Fowler, M.A., F.L.S.

No. II.—OUR OWN HOUSES.

In treating of the natural localities of British Coleoptera, the question arises whether it is better to take the different groups in order, and point out where the members of these groups are to be found; or whether it is better to take different localities, such as a wood, the sea-shore, a hay-stack, rotten wood, &c., and say a few words on the beetles that are likely to be found in these localities. The first course is the most satisfactory from a scientific point of view, as different groups are usually formed for peculiar habitats, and are usually found in such habitats, though it may be in different parts of the country. Still there are great exceptions to this rule; thus we may very often sweep or beat ground-beetles off herbage or trees, and many species are found under bark; many of the carrion beetles, too, are often found on flowers. As, then, these papers are meant merely to serve as hints to beginners, as showing them roughly where they may expect to find certain groups or certain particular insects, it seems preferable to adopt the second course, *viz.*, to take different localities and point out what beetles we may expect to find, if we work them. At the same time it must be understood that this at times may involve a little repetition and a little confusion, for, as we first saw, there are many beetles that are found in the most varied positions; in fact some seem almost ubiquitous, and turn up wherever one goes.

We need not go far to begin; we have a very fair collecting ground in our own houses. Of course "black-beetles" will at once occur to the beginner, but these belong to the Orthoptera, and are, therefore, not Coleoptera at all. There are, however, plenty of *bonâ fide* beetles. We may perhaps first mention the elegant steel-blue cellar beetle, *Pristonychus terricola*, which is often common in cellars and outhouses. *Sphodrus leucophthalmus* is another species that haunts the same localities, but prefers bakehouses; it is apparently rare, although said to have been common near the metropolis. Species of *Blaps* are also found in the same places. Wine-cellars are often productive of good species, which inhabit the dark-looking fungi that grow on the walls. Not long ago I received *Atomaria nigripennis*, *Mycetæa hirta*, and the rare *Orthoperus atomarius* from such a cellar in Gloucester; the latter, I believe, had only been taken before by Mr. Crotch, at Devizes. *Atomaria nigripennis*, the prettiest of the *Atomariæ*, is mentioned by Stephens as common in cellars at Nottingham. Several species of *Cryptophagi* also occur with these beetles.

The wood-work of old houses is often infested with beetles; every one has heard of the "death-watch," whose ticking in the silence of the night has caused much fear to superstitious minds; this noise is caused by certain species of *Anobium*, probably by the clicking of their mandibles while working or calling their mates. *Anobium striatum* is the commonest: this is the species that makes the little round holes in old furniture with which we are all familiar. *Xestobium tessellatum* is also a common species locally. Another member of the group, *Anobium paniceum*, prefers bread and farinaceous substances to wood. Many species of *Ptinidæ* also occur,—of these *Ptinus fur* and *P. crenatus* are the commonest; while the pretty *Ptinus sexpunctatus* is always a rarity. *Mezium affine*, looking like a ruby in a bright light, and *Gibbium scotias*, its close ally, must not be forgotten. I once received a very large number of the former species, taken in London, from Mr. G. C. Champion; the latter seems very rare or hard to get hold of. The commonest beetle, however, of this class is *Niptus hololeucus*, which at one time was considered a rare insect, but is now exceedingly abundant; it is often called the "wine-glass" beetle, from dropping into wine-glasses in old cupboards, and, being unable to get out, is so captured.

Our natural-history collections often suffer very much from beetles, *Ptinus fur*, above mentioned, being, as its name implies, the most mischievous, although perhaps *Attagenus pellio* is the worst pest of insect collectors. *Megatoma undata* occasionally turns up in boxes of insects, and rare *Lathridii* occur sometimes in collections of plants. Mr. P. B. Mason, of Burton-on-Trent, last year found several specimens of the very rare *Lathridius filum* in his herbarium. *Anthreni* larvæ also are sometimes destructive. While on the subject of damage we must not forget to mention *Dermestes lardarius*, which is often found in bacon, and all the various species of granary beetles, of which so extensive a list is given by Mr. Billups in the 'Entomologist' for Sept., 1880 (Entom. xiii. 208). Foremost among these come the *Calandræ*, then *Tenebrio obscurus* and *T. molitor* (whose larva is the well-known meal-worm), and then *Trogosita*, *Lemophlæus*, *Tribolium*, *Alphitobius*, *Rhizopertha*, and others. The great majority of these "granary beetles" ought not to be in our lists, being merely importations; but, as it is hard to eliminate those that are not British, it is necessary for us to include the whole in our collections at all events. Many true British species, such as *Homalium concinnum*, *Oligotæ*, and other *Staphylinidæ*, and occasionally also the rare *Mycetophagus quadriguttatus*, may be found in wheat or flour bins in farm outhouses.

To pass on, one of the best methods of collecting in the house is from the windows. All of us know how, on a warm summer's day, the windows seem alive with small insects, and if we examine them we shall find that a great majority of them are coleopterous. These mostly consist of small *Staphylinidæ* (especially *Oxyteli* and *Homalotæ*), *Trichopterygidæ*, *Lathridiadæ*, &c.

One day at Hunstanton I casually bottled a few *Trichopterygidæ* off a lodging-house window; one of these turned out to be *T. Guérini*, a species hardly ever before taken, and another, *Smicrus filicornis*, which had never been captured in Britain except by the Rev. A. Matthews. *Euthia*, and often *Scydmænidæ*, may be taken in the same way. The corridors of the Crystal Palace are celebrated for this particular method of collecting, and I hope that some of the numerous rising generation of London coleopterists will work them during the coming season, as they will be sure to reap a good harvest. *Trichophya pilicornis* has been taken there abundantly; and many good *Cryptophagi*, besides hosts of other things.

If an old log be put on the fire, the windows should be carefully examined, as numbers of wood-beetles may be found which have been driven out of the wood by the heat. I remember swarms of *Hylesinus oleiperda* having been taken in this way by Mr. W. G. Garneys, of Repton.

In conclusion, I would say, do not neglect your doorsteps. These are often whitened, and attract many good species. Mr. Harris, in this way, took *Bagous diglyptus* (new as British and rare on the Continent) at Burton, and a short while ago I took *Oxytelus insecatus* (which has not, I believe, been before recorded from this district) in the same fashion.

Good beetles, such as *Lathridius carinatus*, *Bembidium quinquestriatum*, and others may be often found on the outside walls of a house; and besides all these there are beetles in thatch, beetles in pigeon-cotes, beetles in sparrows' nests in our water-pipes, beetles in all our surroundings; but these had better be treated of under some other heading.

The School House, Lincoln, February 1, 1882.

INTRODUCTORY PAPERS ON *ICHNEUMONIDÆ*.

By John B. Bridgman and Edward A. Fitch.

No. II.—ICHNEUMONIDÆ (*continued*).

Phæogenes, *Wesm.*

The females in this genus are generally furnished on the under side of the hind coxæ with a distinct process, varying with the species. For the sake of brevity we give a list of the different forms, as described by Wesmael in his 'Teutamen' (p. 180). A sign is placed before each form, and these again will be placed in parentheses before the insect to indicate the structure of the coxæ of each female. The genus *Diadromus*, Wesm., was distinguished from *Phæogenes* by having the apex of the clypeus abruptly depressed. Wesmael afterwards thought these two genera might be united; and as Mr. Marshall has merged them in his catalogue we shall do the same. *Phæogenes collaris* was included by Gravenhorst in the genus *Ischnus*, it having a very prominent scutellum; but Wesmael thought the petiole was too long and slender for it to remain there, so he moved it to *Diadromus*.

(1.) The process beneath the hinder coxæ in the form of an abrupt tooth.

(2.) The process in the form of an oblique keel, with the apex produced into a longer or shorter (sometimes subobsolete) tooth.

  (x.) Keel of coxæ straight or somewhat sinuous.

  (xx.) Keel of coxæ interrupted.

(3.) Process in the form of a small crest or oblique line.

(4.) Hind coxæ without any process.

SECTION 1.—Thorax and abdomen black; antennæ of female generally white-ringed.

A. Femora and tibiæ red (male and female).
5. (2. x.) *stimulator*, 3¼—4 lines.
B. Legs red; hind tibiæ and tarsi dark; the former pale-ringed in the middle, the latter pale at the base of joints (male and female).
6. (2. x.) *calopus*, 2½—3 lines (*l*, *a*).
C. Legs almost entirely black (females).
a. Antennæ white-ringed. - 12. (4.) *cephalotes*, 3½—4½ lines (*a*).
b. Antennæ red. - - - - - - (4.) *similis*, 2¾ lines.

SECTION 2.—Scutellum pale marked (sometimes black); abdomen black.

Femora, front and intermediate tibiæ, red (male).
19. *candidatus*, 3½ lines (*s*).

SECTION 3.—Scutellum pale (white or whitish, A and C; red, B); abdomen red and black.

A. Abdomen red, base more or less black or fuscous; antennæ white-ringed (females).
a. Legs red; front coxæ whitish; spine on hind coxæ long.
4. (1.) *scutellaris*, 2½—3 lines (*s*).

b. Legs red; hind coxæ and femora black: hind coxæ unarmed.
14. (4.) *troglodytes*, 3 lines (*l*, *s*).

B. Abdominal segments, 2nd to 3rd or 4th, vary from yellow-red to brown-red, or almost black; legs and antennæ red; generally pro- and meso-thorax also (female). 18. (4.) *collaris*, 2¼ lines (*l*, *s*, *a*).

C. Abdomen marked with red and black, or dark brown (males).

a. Face whitish; legs reddish straw, base whitish.
4. *scutellaris*, 3 lines (*l*, *s*).

b. Orbits white; front legs fulvous, base white; hinder nigro-fuscous, apex of coxæ and of trochanters, white. 14. *troglodytes*, 2¼ lines.

c. Face black, coloured as in the female, but with the mesothorax black.
18. *collaris*, 2¼ lines (*s*, *l*, *a*).

SECTION 4.—Scutellum black; abdomen red, or red and black.

A. Hind femora red: apex black; base and apex of hind tibiæ black, remainder red; antennæ tricoloured (females).

a. Coxæ red.

* Hind coxæ armed.

† Abdominal segments, 1st to 4th, red, 1st more or less black; post-petiole shining. - - - 3. (1.) *melanogonus*, 2¼—3 lines.

†† Segments, 2nd to 4th or 5th, red; post-petiole finely aciculate.
7. (2. x.) *fulvitarsis*, 3¼ lines.

** Hind coxæ unarmed.
Segments, 2nd to 4th, red; post-petiole shining.
(4.) *formosus*, 3¼ lines.

b. Coxæ black.

: Segments, 1st to 5th, red; petiole black; tooth on coxæ long.
1. (1.) *semivulpinus*, 3½—4 lines.

:: Segments, 1st to 4th, red; petiole black.

§ Tooth on coxæ moderate. - - 2. (1.) *planifrons*, 3—3¼ lines.

§§ Interrupted keel on hind coxæ. - 8. (2. xx.) *ophthalmicus*, 3 lines.

B. Legs red; apex of hind femora and tibiæ black; segments, 2nd and 3rd, and towards the base of the antennæ, red; coxæ with a very minute tooth (female). - - - - 17. *imbellis*, 2¼ lines.

C. Legs red: apex of hind femora and base of hind coxæ dark; antennæ tricoloured[*] (females).

a. Abdominal segments, 2nd to 4th, red, 5th to 7th red-margined.
10. (3.) *ischiomelinus*, 2¼—3 lines (*l*).

b. Segments, 1st to 4th, red. - - 16. (4.) *jucundus*, 3¼ lines.

D. Legs red; base of hinder coxæ fuscous (females).

a. Antennæ with a white ring.

* Abdominal segments, 1st to 4th (and margins of 5th to 7th in *ischiomelinus*), red; 1st segment more or less black; apical segment not red marked.

† Hinder coxæ with a small crest.
10. (3.) *ischiomelinus*, 2½—3 lines (*l*).

†† Hinder coxæ unarmed. - - - 15. (4.) *guttulatus*, 3 lines.

** Abdomen red, base black; coxæ with a long tooth.
4. (1.) *scutellaris*, 3¼ lines (*s*).

b. Antennæ dark, towards the base red. - (4.) *impiger*, 2¼ lines.

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[*] The antennæ vary much in depth of colouring; sometimes the pale ring is almost wanting.

E. Legs red; coxæ and femora of hinder one black (female).
Antennæ red, white-ringed; abdomen red, 1st segment black.
14. (4.) *troglodytes*, 2½—3 lines (*s*, *l*).
F. Legs entirely red; antennæ and abdomen as in E (female).
14. (4.) *troglodytes*, 2½—3 lines (*s*, *l*).
G. Femora and tibiæ red; hind femora sometimes more or less fuscous, and sometimes the front ones also; hind tibiæ, base black, apex fuscous; coxæ black, front ones often red at the apex (female).
Segments, 2nd to 3rd, red- or black-marked, or apical margins only distinctly or obsoletely red; antennæ red, subannulated.
(4.) *suspicax*, 2 lines (*l*, *a*).
H. Femora and tibiæ of front legs red, or partly so; remainder entirely, or nearly all, black (females).
a. Hind coxæ unarmed; middle of abdomen chestnut or reddish.
* Antennæ white-ringed. - - - 12. *cephalotes*, 2¼—4½ lines.
** Antennæ red-ringed. - - - - 13. *acutus*, 2½—3¾ lines.
b. Hind coxæ with a small crest; antennæ dark brown; abdominal segments, 2nd to 3rd, red, with a dark spot in the centre of each.
(3.) *nanus*, 2 lines.
c. Hind coxæ with a minute tooth; antennæ dark brown; abdominal segments, 2nd to 3rd and base of 4th, red. (3.) *trepidus*, 2½ lines.
AA. Coxæ black (males).
Abdominal segments, 2nd to 4th or 5th, red, sometimes with black marks (†); legs dark, front ones partly pale, as well as middle of hind tibiæ, and base of femora more or less so.
a. Post-petiole smooth, or faintly aciculate.
* Cheeks dilated below the mandibles; forehead reticulate, with coarse punctures. - - - - - 1. *semivulpinus*, 3½—4 lines.
** Cheeks not dilated below the mandibles; forehead shining, with rather fine punctures.
† Face very protuberant. - - - - 3. *melanogonus*, 3 lines.
†† Face not very protuberant. - - - 2. *planifrons*, 3—4 lines.
b. Post-petiole very rugose, and with two keels; segments, 2nd to 4th, castaneous; disk cloudy or black, partly red.
12. *cephalotes*, 3½—4½ lines.
c. Post-petiole entirely punctated.
* Hind tibiæ, towards the middle, piceous or black.
8. *ophthalmicus*, 3 lines.
** Hind tibiæ pale red, also apex of hind femora. 9. *mitigosus*, 2½ lines.
BB. Coxæ not all black (males).
a. All the coxæ red; legs red; apex of hind femora, base and apex of hind tibiæ, red.
* Segments, 1st to 4th, red. - - - 16. *jucundus*, 3½ lines.
** Segments, 2nd to 5th, red. - - - 7. *fulvitarsis*, 3½ lines.
b. Hind coxæ black; front ones pale.
† Middle segments of abdomen red-margined.
‡ Face, or at least the clypeus, yellow. - - *suspicax*, 2 lines.
‡‡ Face black. - - - - - - 17. *imbellis*, 2—2¼ lines.
†† Segments, 2nd to 4th, sometimes with dark marks; 2nd generally so; hind coxæ black, apex pale straw. 10. *ischiomelinus*, 2½—3 lines.
††† Segments, 2nd to 4th and margins of 1st and 5th, greater part of legs, and scape of antennæ, red. - - 11. *conciliator*, 2¼ lines.

P. impiger, Wesm., *P. suspicax*, Wesm., *P. nanus*, Wesm., and *P. trepidus*, Wesm., have been added to the British list since the publication of Mr. Marshall's catalogue, and *P. similis* and *P. formosus* have been described as new (Trans. Ent. Soc. Lond., 1881, pp. 147–149). Several of these smaller and closely-allied Ichneumons are quite common in Britain, but they are generally overlooked, and but little understood in this country; hence we have but little reliable information as to their occurrence and habits. From the following list of hosts, however, it will be noticed that they appear to be more particularly parasitic on the larvæ of the Micro-Lepidoptera. Several species of the genus have been bred from various *Psychidæ*. Brischke is said to have bred a species from *Saperda populnea*, which Ratzeburg doubtfully determined as Wesmael's *P. suspicax* ('Die Ichneumonen,' iii. 167). The host was probably a Tortrix, and the species of parasite is somewhat doubtful (*cf. infra*, host of *P. imbellis*). Vollenhoven has well figured a species belonging to the *semivulpinus* and *melanogonus* group, with the coxal process toothed, in his 'Schetsen' (pt. 1, pl. iii., fig. 16). *P. similis* and *P. formosus* are figured in the Entomological Society's 'Transactions' for 1881 (pl. viii., figs. 4 & 5).

The following British species have been bred:—

1. semivulpinus, *Gr.*,	from	Tortrix rosana; Kawall, Brischke (lævigana). Euchromia rufana (rosetana, *Hb.*); Rondani.
3. melanogonus, *Gmel.*	,,	Œnectra pilleriana; Taschenberg. Depressaria nervosa; Vollenhoven, Fitch Coll.
5. stimulator, *Gr.*	,,	Tortrix viridana; Ratzeburg. Yponomeuta padella; Butler.
14. troglodytes, *Gr.*	,,	Cerostoma?; Voll.
17. imbellis, *Wesm.*	,,	Tortrix pupa in tumid twig of Populus tremula: Brischke. [? Semasia corollana, *Hub.* (Heegerana, *Wilk.*)]
18. collaris, *Gr.*	,,	Tortrix pupa on oak; Brischke.
19. candidatus, *Gr.*		"e pupa phalænæ"; Gravenhorst. Tortrix viridana; Bignell.

OIORHINUS, *Wesm.*

Abdomen, female, segments 2nd to 4th entirely, 5th to 7th, apex red; male, 2nd to 7th red-margined. Legs red, hind femora to the middle; base and apex of hind tibiæ fuscous; greater part of hind legs of male black. (Male and female.) - *pallipalpis*, 2½ lines.

See Trans. Ent. Soc. Lond., 1881, p. 149.

ÆTHECERUS, *Wesm.*

A. Apex of cheeks behind the mandibles incurved.

Segments 1st to 4th and legs red; apex of hind fomora and tibiæ black; antennæ red, apex black; hind coxæ furnished with a small tooth. (Female.)

Middle of abdomen red or red-banded; front femora and tibiæ, and hind tibiæ, red. (Male.) - - - *nitidus*, 2½—3 lines.

B. Apex of cheeks behind the mandibles straight.

Segments 2nd to 4th, and legs, fulvous; apex of hind femora, base and apex of hind tibiæ, black; antennæ subtricoloured. (Female.) *longulus*, 2½ lines.

See Trans. Ent. Soc. Lond., 1881, pp. 149, 150.

ORONOTUS, *Wesm.*

Segments, 1st to 4th, and legs, fulvous; front coxæ and trochanters pale; apex of hind femora, base and apex of hind tibiæ, black; 2nd segment of male with two black marks; antennæ of female slender and white-ringed (male and female). 1. *binotatus*, 3½—4 lines.

Gravenhorst described his single male as a *Phygadeuon*. This species is neither the *Ichneumon binotatus* of Stephens (Ill. Brit. Ent., Mand. vii. 147) nor of Desvignes (Cat. Brit. Ichn., p. 23). Both sexes are beautifully figured by Vollenhoven in 'Pinacographia' (pl. 36, figs. 8, 9 & 9a), where he remarks on the general facies of this rare species having a certain resemblance to an *Anomalon;* its slender, compressed, abdomen reminds one of *Limerodes.* Vollenhoven conjectures that it is parasitic on one of the grass-feeding *Leucaniidæ*.

ISCHNUS, *Grav.*

A. Thorax red, variegated with black and yellow; abdomen black; legs red (male and female). - - 2. *thoracicus*, 2—2½ lines.

B. Thorax not red; scutellum only, sometimes red.

a. Scutellum, legs, and middle of abdomen, red (female). 1. *nigricollis*, 3 lines.

b. Scutellum, legs, apex of hind tibiæ, tarsi and abdomen, black (male). 1. *nigricollis*, 3 lines (*s, l*).

c. Scutellum black; 2nd and 3rd segments towards the apical margins at the sides, castaneous; legs red; apex of hind tibiæ and tarsi fuscous (male). - - - - - 3. *rufipes*, 4½ lines.

This genus, as restricted by Wesmael, contains but one Gravenhorstian species (*thoracicus*); it is figured in Vollenhoven's 'Schetsen' (pt. i., pl. i., fig. 3). The British species of *Ischnus* appear to be exclusively parasitic on the larvæ of *Pterophoridæ*; but Dr. Giraud has bred other species from *Talæporia*, *Coleophora*, and *Argyresthia*.

1. **nigricollis**, *Wesm.*, from Pterophorus (Aciptilia) galactodactylus; Barrett, Porritt.
2. **thoracicus**, *Gr.* „ Pterophorus (Mimæseoptilus) phæodactylus; Kaltenbach; P. (Aciptilia) pentadactylus; Brischke, "from larva feeding on the large white-flowering convolvulus, 5th July." Ruthe's Coll., B. M. (? *A. pentadactylus* or *M. monodactylus* (*pterodactylus*), pupa preserved).

Heterischnus, *Wesm.*

Black; legs red; antennæ white-ringed (female). 1. *brevicornis*, 3—3½ lines.

Ectopius, *Wesm.*

Black; spot below the eyes, and base of wings, yellow; stigma fuscous; femora and tibiæ red; extreme margin of 2nd abdominal segment castaneous. (Male.) - - 1. *rubellus*, 3 lines.

The only British specimen we know of this species is that in the National Collection from Stephens' collection, although Gravenhorst says of it, "Mares copiose legi mense Augusto in umbellatis, circa Cudovam."

Microleptes, *Grav.*

Black; legs red (female). - - - 1. *splendidulus*, 2 lines.

This species, originally described from a single female captured at Netley and sent by Hope to Gravenhorst, is well figured in Stephens' Illustrations (Mand. vii., pl. xl., fig. 3), from two specimens taken at Charlton, in August, which are now in the National Collection. It is also figured in Vollenhoven's 'Schetsen' (pt. i., pl. i., fig. 6).

Alomyia, *Panz.*

Black; abdomen in the middle, and tibiæ, rufo-testaceous (female, antennæ testaceous-ringed). The abdomen of the male varies much; sometimes it is yellow in the middle, more or less black, or quite black. - - - - 1. *debellator*, 5½—7 lines (*a*).

This single representative of Wesmael's *Ichneumones heterogastri* and of Förster's *Alomyina* is widely distributed, and not uncommon in Britain, but it has never been bred. This variable species is figured by Panzer, Latreille, Curtis, and Vollenhoven.

Since the table of *Ichneumones pneustici* (Entom. xv. 11) was printed, another of Wesmael's genera has been detected as occurring in this country, viz., *Gnathoxys.* The proper place for this genus in the above table is between † and ‡, where ought to be inserted:—

1. Mandibles unidentate. *Gnathoxys*, Wesm.
2. Mandibles bidentate.

GNATHOXYS, *Wesm.*

Black; sides of scutellum (or entirely in a var. of male), line at base of wings, orbits, white; apical margin of abdominal segments reddish; legs red. Male, coxæ and trochanters black. (Male and female.) - - - - - *marginellus*, 2¼—3 lines.

A splendid female was captured by Mr. G. C. Bignell on September 24th, 1881, at Plymbridge, near Plymouth.

OBSERVATIONS ON THE HABITS OF ANTS.*

BY SIR JOHN LUBBOCK, Bart., M.P., F.R.S., Pres. Linn. Soc.

RECOGNITION OF RELATIONS.

In my previous paper† I have recorded some experiments made with pupæ in order to determine in what manner ants recognise their comrades.

For instance, I separated a nest of *Formica fusca* into two divisions in the spring before the season for laying eggs. Then in the autumn I took ants from one half (which I may call A) and put them into the other half (which I may call B). Thus, of course, there could be no question of individual recognition. Nevertheless, in nine cases such ants were received as friends. This season, again, on the 10th April, 1881, I divided a two-queened nest of *Formica*, leaving a queen in each half. At that time no eggs had yet been laid, and of course there were no larvæ or pupæ. In due course both queens laid eggs, and the young ants were brought up in each half of the nest. I will call the two halves, as before, A and B. On the 15th August, at 9 a.m., I put three of the young ants from A into B, and three from B into A. At 9.30 none are attacked. At 10, the same. At 10.30, the same; one is being cleaned. At 12, the same. At 2 p.m. the same. In fact they seemed quite at home with the other ants. The next morning I was unable to recognise them, the paint having been entirely removed. The ants were all peaceably together in the nest, and there were no dead ones either in the nest or in the outer box. It is evident, therefore, that they had been treated as friends.

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* Concluding Abstract of a Paper read before the Linnean Society, November 17th, 1881, continued from Entom. xv. 56.

† Journ. Linn. Soc. vol. xiv. p. 610.

August 17.—I put in three more from B into A at noon. At 12.30 they were with the other ants. At 1, the same. At 2, the same. At 3, the same. At 5, the same. The following morning I was still able to recognise them, though most of the paint had been removed. They also were evidently treated as part of the community.

Sept. 19.—Put in three more from A into B at 8.30 a.m. I looked at them at intervals of half an hour; but none of them were attacked. Next morning there was no ant outside the nest, nor had any been killed.

Oct. 10.—Put in three more at 7 a.m., and looked at intervals of an hour. They were not attacked, and evidently felt themselves among friends. The next morning I was still able to recognise two. There was no dead ant either in the nest or the outer box.

Lastly, on the 15th Oct., I put in four more at 7 a.m., and watched them all day at short intervals. They exhibited no sign of fear, and were never attacked. In fact, they made themselves quite at home, and were evidently, like the preceding, recognised as friends. For the sake of comparison, at noon I put in a stranger. Her behaviour was in marked contrast. The preceding ants seemed quite at home, walked about peaceably among the other ants, and made no attempt to leave the nest. The stranger, on the contrary, ran uneasily about, started away from any ant she met, and made every effort to get out of the nest. After she had three times escaped, I let her go.

Thus, then, when a nest of *Formica fusca* is divided early in spring, and when there are no young, the ants produced in each half were in twenty-eight cases all received as friends. In no case was there the slightest trace of enmity.

Peculiarities of Manner in Different Species of Ants.

In one of my previous memoirs* I have observed that the behaviour of *Lasius flavus* offered in some respects a surprising contrast to that of *Formica fusca.* In experimenting on the power of recognising friends possessed by these species, I found that while specimens of *Lasius flavus* readily, and even of their own accord, entered other nests of the same species, *Formica fusca*, on the contrary, showed a marked reluctance to do so; and I had some difficulty in inducing them to do so. At that time, however, I did not ascertain what became of the specimens thus introduced into a strange community. I thought it would be worth while to determine this; so I took six ants from one of my nests of *Lasius flavus*, marked them, and introduced them into another nest of the same species. As in the preceding cases, they entered quite readily; but though they were not at first attacked, they were evidently recognised as strangers. The others examined them carefully, and at length they were all driven out of the nest. Their greater readiness to enter a strange nest may perhaps be accounted for by the fact that, as a subterranean species, their instinct always is to conceal themselves underground, whereas *F. fusca*, a hunting species, does not do so, except to enter its own nest.

Longevity of Ants.

In my previous paper I have called attention to the considerable age attained by my ants; and I may perhaps be permitted to repeat here, *mutatis mutandis*, a paragraph from my last communication with reference to my most aged specimens, most of those mentioned last year being still alive. One of my nests of *Formica fusca* was brought from the woods in December, 1874. It then contained two queens, both of which are now still alive. I am disposed to think that some of the workers now in the nest were among those originally captured, the mortality after the first few weeks having been but small. This, of course, I cannot prove. The queens, however, are certainly more than seven, and probably more than eight, years old. In the following nests, *viz.* another nest of *F. fusca*, which I brought in on the 6th June,

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* Journ. Linn. Soc.

1875, and one of *Lasius niger* on the 30th November, 1875, there were no queens; and, as already mentioned, no workers have been produced. Those now living are therefore the original ones; and they must be between six and seven years old.

I had also some workers of *Lasius niger*, which I began to observe on the 6th July, 1875; the last of these died on June 15th, 1881; and some of *Formica cinerea* on the 29th November, 1875; the ants in this nest died off somewhat rapidly, the last on July 23rd, 1881. There were no queens in either of these nests.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Argynnis Adippe at Wicken.—Having succeeded in procuring a small house in this village, I devoted the first fortnight of last August to entomologising. Ten years previously I had, under the guidance of Mr. F. D. Wheeler, of Norwich, made my first acquaintance with *Nonagria Helmanni*, *Apamea fibrosa*, and various other fen species. These are so well known to be inhabitants of Wicken Fen that I do not propose to trouble you with a list of even the better species I took. My house was some five hundred yards from the nearest part of the fen; but this did not prevent numerous specimens of *Papilio Machaon* from finding their way to my garden, and among them, much to my surprise, I took on August 1st a specimen of *Argynnis Adippe*. Now anyone who is acquainted with Cambridgeshire knows that no other English county is so destitute of woods; and *A. Adippe*, as far as I know, is entirely a wood insect. I believe I am right in saying that it frequents none but large woods. The only attempt at a wood within moderate reach of the village is a spinney, perhaps one hundred and fifty yards long and fifty wide, chiefly celebrated as producing *Hadena atriplicis* in some quantities. *H. atriplicis*, however, is a species that is widely distributed in the fen-country, whereas *A. Adippe* has, to the best of my knowledge, been recorded from two localities only in Cambridgeshire. From Mr. Skertchley's interesting book on 'The Fenland Past and Present' I learn that it has occurred at Bourn Wood, nine miles west of Cambridge, and that a single specimen was taken at Wisbech in 1876. If the present note should come under the eye of the gentleman who made the

Wisbech capture, perhaps he would favour your readers with some details concerning it. I find, on reference, that Stainton and Newman give no Cambridgeshire localities for the butterfly in question.—GILBERT HENRY RAYNOR; Hereward Hall, Ely, February 20, 1882.

HERMAPHRODITE LYCÆNA ALEXIS.—During August last, a friend who had been collecting for my brother gave him an hermaphrodite specimen of *Lycæna Alexis*, which he had taken near Sturton, in North Notts.—T. GIBBS, JUN.; Bretby, Burton-on-Trent, February 9, 1882.

LARVÆ OF SMERINTHUS OCELLATUS. In August of last year Mr. F. Purchas and I collected upwards of fifty of the larvæ of this moth from the apple-trees in our gardens, which nearly adjoin. The amount of leaf pabulum devoured by them was surprising, and had they been allowed to have remained on the trees they would have quickly stripped them of leaves.—JOSEPH ANDERSON, JUN.; Chichester, March 15, 1882.

LARVÆ OF STAUROPUS FAGI FEEDING ON APPLE.—On the 12th August, 1881, a caterpillar of *Stauropus fagi* about half-grown was found by Mr. Purchas on an apple-tree in his garden. When in captivity I gave it oak and apple, but it greatly preferred the leaves of the latter. In due time it spun up, choosing, however, two oak-leaves for the purpose of enclosing the pupa. I can see that it safely passed into the pupa state, and hope that eventually it will produce a fine imago. I may mention that one of the horns was slightly deformed. Neither Stainton nor Newman mention apple as a food plant; perhaps, therefore, it may be useful to some collectors to know that the larva can be reared on this tree. —JOSEPH ANDERSON, JUN.; Chichester.

NYSSIA HISPIDARIA.—On February 25th I took a good series of *Nyssia hispidaria* in Richmond Park, one specimen being a black variety. I also saw *Amphidasis prodromaria* taken; *Phigalia pilosaria* being common.—J. A. COOPER: 32, Bingfield Street, London, N., March 15, 1882.

EARLY APPEARANCE OF BREPHOS PARTHENIAS.—As an instance of the effect the present extraordinarily mild weather is having upon the emergence of insects, I may mention that I observed *B. parthenias* flying in numbers over the tops of the birch-trees in the woods between Epping and Ongar on the 12th March. I captured a few specimens, some of which had evidently been on the wing some days, and I think the first week in this month may be safely given as the date, this year, of the first appearance of *Brephos* in this locality. On referring to my diary I find my earliest previous capture in past seasons was on the 28th March.—HAROLD CONQUEST; Chingford, March 15, 1882.

DASYCAMPA RUBIGINEA, &c.—This species was taken by me on October 25th. I found it enjoying itself on the ivy-bloom in the garden, in company with *Hoporina croceago* and *Xylina semibrunnea*. In reply to notes from Bournemouth, *Xylophasia polyodon*, *Phlogophora meticulosa* and *Plusia gamma* have been very abundant in this neighbourhood.—T. HOULTON; Hawley, Hants, near Scarborough, January 14, 1882.

EARLY APPEARANCE OF CIDARIA CORYLATA.—On March 12th I captured a specimen of *C. corylata* in very fine condition, in a lane near Child's Hill. This is, I think, very early for this species.—J. RUSSELL; 6. Leverton Street, Kentish Town, N.W.

CHEIMATOBIA BRUMATA.—Mr. Cooke, in his announcement (Entom. xv. 57) of "A Geometer new to Science," seems to base his conclusions principally on the date of capture, judging from the following remarks:—"The species is so much like *C. brumata* that I entertained some doubt about it being a distinct species; but he yesterday (February 7th) visited the spot where he found the larvæ, and captured five males (two just emerged) and one female on grass and posts near the sweet gale. *I think this conclusively proves* that the moth is quite distinct from *C. brumata*, as that species must have been quite over for a full month." I may inform Mr. Cooke that *C. brumata* is generally quite common here right away to the end of January; I have seen specimens—even in a severe winter—in perfect condition in the middle of February; in fact it is often seen quite to the end of that month (February), and odd ones have been taken in the beginning of March.—J. W. CARTER; Bradford, March 14, 1882.

DESCRIPTION OF THE LARVA OF PTEROPHORUS MONODACTYLUS, *Linn.*, = PTERODACTYLUS, *Haw.*—During last summer a young "plume" larva, which proved to be this species, was accidentally brought in with some convolvulus I had gathered for a brood of larvæ of *P. pentadactylus*. By the middle of August it was full-grown, when I described it as follows:—Length, when at rest, about five-eighths of an inch, and stout in proportion. Head polished and rather small, narrower than the 2nd segment. Body uniform and cylindrical, tapering a little posteriorly. Segmental divisions well defined and deeply cut ventrally; each tubercle emits a tuft of short but rather strong hairs. Ground colour bright yellowish green, more decidedly green on the back; head pale yellow, the mandibles light brown. A fine but clear yellowish white line forms the dorsal stripe; there is a much broader stripe of the same colour along the spiracular region, and the space between it and the spiracles is prickled with streaks and spots of the same colour. Spiracles black, hairs greyish. Ventral surface, legs, and prolegs uniformly pale green. The pupa, although attached by the tail only, was laid flat along the top of the cage. It produced a fine imago on September 14th.—GEO. T. PORRITT; Highroyd House, Huddersfield, Feb. 3, 1882.

COLLECTING NEAR COVENTRY.—One afternoon in the woods of Bubbinhall, near Coventry, convinced me that it was a locality by no means to be despised by collectors. In about two hours, besides many more common species, a friend and myself took about half a dozen *Erastria fuscula*, *Phorodesma bajularia*, and *Geometra papilionaria*, which latter was very common. This was in the middle of July, and the weather was all that could be desired.—H. ROWLAND BROWN; Oxhey Grove, Stanmore.

FIXITY OF TENURE BY A MOTH.—For the last three days a specimen of *Tæniocampa gothica* has occurred in a similar position outside one of the window-frames of my dining-room, which has been unoccupied each evening, when presumably the moth was absent on business. To-day it is not there. This habit may be general in the insect world, but I never remember noticing it before; Piepers instances it as a mark of retentive memory in an East Indian butterfly (Entom. x. 270).—EDWARD A. FITCH; Maldon, Essex, March 21, 1882.

FUNGUS GROWING ON DEAD LARVA.—I found on March 11th, about two inches below the surface of the earth, when digging for pupæ at the trunk of an ash near Curraghmore, a lepidopterous larva attacked in a similar manner to that figured in the 'Entomologist,' vol. xi., p. 121. The fungus, which is well developed, appears to be a species of the genus *Torrubia*, as described by

Dr. Buchanan White in the article above quoted. The fungus is somewhat more robust than that figured in 1878, and the larva, of what species I know not, is more contracted and shrivelled.—(Rev.) William W. Flemyng; Portlaw, Co. Waterford, March 13, 1882.

Plectroscelis aridula, *Gyll.*—Whilst staying at Chilham, near Canterbury, in September last, I caught one or two specimens of *Plectroscelis aridula*, Gyll., by sweeping amongst the herbage under hedgerows. At the time I did not recognise the species, or probably I should have been able to obtain many more specimens. Unfortunately I can now only find one of them in my laurel bottle. I hope to get the species again next year, as I believe most *Halticidæ* are generally to be found on their respective food-plants in their localities.—A. Sidney Olliff; 36, Mornington Road, Regent's Park, N.W.

Callistus lunatus, *F.*, at Reigate.—It may interest some of your readers to know that, on the 13th of last month, after several unsuccessful visits to Reigate in hopes offinding this beautiful Coleopteron, I at last succeeded in finding its habitat, and captured nine specimens. I have little doubt I should have been enabled to supply a few to friends if allowed to collect a little longer; but, after some few minutes my happiness was somewhat rudely terminated by a pair of the most cantankerous gamekeepers it has ever been my lot to meet with, and whom no amount of persuasion and argument on my part could convince that I was not after the rabbits; and so little did I impress them that they would not leave me until they had walked me nearly a mile away from the spot. This is, I believe, the greatest number of this lovely insect that has been taken at one time since Messrs. Power and Janson collected it in such numbers, now nearly twenty years since.—T. R. Billups; 20, Swiss Villas, Coplestone Road, Peckham, March, 1882.

Ichneumon erythræus, *Gr.*—While searching for Coleoptera at one of my favourite localities in the neighbourhood of Mickleham, on the 22nd of February, I was agreeably surprised to meet once more with the above very beautiful and probably our handsomest species of the British Ichneumonidæ. As I believe this is the first recorded account of its capture, it perhaps will be useful to note the circumstances under which the present insects were taken, the mode being very different to that by which I took the two specimens last summer; one of those was taken on the wing, and the other by sweeping, but both within a few yards of the locality of this year's specimens, which were captured in the following manner:—I was cutting tufts of grass and shaking them over paper for Coleoptera, when to my surprise out fell *Ichneumon erythræus*, Gr. This, to me, was the more remarkable, as the little tufts of grass were growing upon the small mounds of earth raised by *Formica flava* (the small yellow ant). Every piece I cut brought up numbers of the little worker: with these exceptions, there was no other insect to be seen, and although there were numbers of isolated tufts growing around, many of which I cut, I in no case found a single specimen of *I. erythræus*, unless the grass was cut off a hillock of *Formica flava*. Mr. Fitch informs me that there are only two old Stephensian specimens of this insect in the collection at the British Museum, and I believe that nothing whatever is known of its habits or economy; so meeting with this insect under what I think peculiar circumstances may only be accidental; but if it will assist in solving the mystery of its economy, or will help hymenopterists to trace out its habits, my note may not be in vain. — T. R. BILLUPS; 20, Swiss Villas, Coplestone Road, Peckham.

ECONOMY OF CHALCIDIDÆ.—In the 'American Naturalist' for January and February, 1881 (vol. xvi., pp. 60 and 149), Mr. L. O. Howard gives some interesting notes "On some Curious Methods of Pupation among the *Chalcididæ*." He mentions the economy of one of the *Elachistidæ* (*Euplectrus albitrophis* MS) which economises the empty larva-skin of the Tortricid host (*Phoxopteris divisana*, Walk.) into a tent for its separately clustered pupæ. Then the curious pillars supporting the walls of an oak-leaf *Lithocolletis*-mine, as a protection to the single loose pupa of a *Chrysocharis*—one of the *Entedonidæ*. He next alludes to the curious assemblage of black coarctate *Eulophus* pupæ found upon a leaf; these at first sight were taken for the excrement of some lepidopterous larva, and the hairs of the bombycid larval host were taken to be sporidia of some fungus thereon. Last year Mr. Billups gave me similar pupæ of the common *Eulophus ramicornis* bred from *Demas coryli* and *Notodonta camelina*, and I believe he made some interesting notes on their economy.

Mr. Howard mentions an *Astichus* as parasitic in the *Eulophus* pupæ: this is probably an error of determination, as our pretty *Astichus arithmeticus* is undoubtedly a parasite of *Cis*, and not an hyperparasite. The interesting economy of the *Encyrtidæ*, which we know so well in this country, is then adverted to, firstly, the parasitism of *Holcothorax* and its allies on the various leaf-mining *Lithocolletidæ* and other Micros is alluded to, and then the remarkable numbers of *Copidosoma*, whose very numerous, closely packed, cocoons inflate the larvæ of various Lepidoptera. For numerous examples of these Micro-parasitic *Encyrtidæ* I am indebted to Mr. John Sang. I bred the common *Copidosoma truncatellum* last year in immense numbers from a closely-stuffed larva of *Zeuzera æsculi*, sent me by Miss R. M. Sotheby (see Proc. Ent. Soc. Lond. 1881, p. xxi); quite lately Mr. Meldola has given me a naturally-preserved larva of *Thera variata*, with a boxful of its resultant parasites; these also prove to be the common *C. truncatellum*. The year before last, much-distended specimens of *Depressaria nervosa* larvæ, sent to me by Mr. Bignell, produced the closely allied *C. chalconotum*. For the hosts of the numerous *Encyrtidæ*, consult Dr. Mayr's lucid monograph 'Verh. z.-b. Ges. Wien.,' xxv., 675-778. Mr. Howard refers to parasites of this family on a *Lithocolletis*, two *Gelechiæ*, an *Anarsia*, and a *Plusia*. Mr. Pergande counted those bred from one larva of *Plusia brassicæ* to be 2528.—Edward A. Fitch; Maldon, Essex.

Thripidæ wanted.—I am now making a special study of the Thysanoptera, and am much in need of specimens of the described European species. Possibly entomologists, farmers, or gardeners in Britain will kindly collect me specimens, and transmit them to me in small pill- or chip-boxes, numerous specimens of each species with a portion of the plant from which it is obtained in each box. Several of these boxes may be packed in square or other tin boxes, and mailed to me at once. In return I will gradually send specimens, well mounted in balsam, of all such species as in the course of time I may study. These insects are found on almost all kinds of plants, either on their leaves, flowers, or sometimes their fruit; under loose bark of living trees, and under the bark of dead trees or stumps, at all seasons; frequently in hollow stems which were inhabited by other insects; in different kinds of galls, especially such as are produced by cecidomyideous flies and Aphides; also between the leaves of grass, throughout the year. It will thus be seen that they are to be found in a variety of situations: but, to enable correspondents to secure a large number of species, I annex a list of British species, with the plants on which they may be found:—*Phlæothrips ulmi*, under bark of dead elm and other trees; *P. statices*, in flowers of *Armeria maritima; P. pini*, numerous under bark of old pine-stumps; *Heliothrips adonidum* (*hæmorrhoidalis*), in flowers and on leaves in hot-houses; *H. dracænæ*, on leaves of *Dracæna* in hot-houses; *Sericothrips staphyinus*, in flowers of *Ulex europæus; Chirothrips manicata*, on spikes of grass; *Limothrips denticornis*, on heath and grass; *L. cerealium*, very common on grass and cerealia; *Aptinothrips rufa*, in great numbers in spikes of grass and cerealia; *A. nitidula*, on the heads of *Plantago maritima; Thrips ulicis*, in flowers of *Ulex europæus*, *Crocus susianus*, and on corn; *T. phalerata*, in flowers of *Lathyrus pratensis* and *Vicia sativa; T. obscura*, common on wheat; *T. ulmifoliorum*, on leaves of elm; *T. atrata*, in flowers of *Convolvulus soldanella*, *Dianthus*, *Centaurea cyanus*, *Campanulæ*, &c., and especially *Spergula nodosa; T. vulgatissima*, in all kinds of garden flowers, especially *Narcissi* and *Umbelliferæ*, and numerous in flowers of *Sinapis nigra; T. cynorrhodi*, common in flowers of wild roses; *T. glossulariæ*, in gooseberry-flowers; *T. physapus*, in flowers of *Cichoraceæ; T. fuscipennis*, on *Rumex; T. ericæ*, on heath; *T. urticæ*, in flowers of *Nasturtium*, *Thalictrum*, *Ranunculus*, &c.; *T. corymbiferarum*, in flowers of *Corymbiferæ; T. minutissima*, in *Umbelliferæ; T. discolor*, in flowers of *Cruciferæ; T. livida*, in flowers of *Ulex europæus; T. primulæ*, in flowers of primrose; *T. dispar*, on *Festuca fluitans* and other grasses; *T. brevicornis*, on *Festuca fluitans; T. subaptera*, on *Plantago maritima; T. juniperina*, on juniper; *T. variegata*, on flax; *T. pisivora*, on flowers and pods of peas; *T. persicæ*, on diseased leaves of peach; *Belothrips acuminata*, on sand-hills by the sea, probably in flowers of *Galium verum*, *Lathyrus pratensis*, or *Plantago; Melanthrips obesa*, in flowers of *Sinapis nigra*, *Reseda*, and *Ranunculus; Coleothrips fasciata*, in various flowers, especially *Reseda*.—THOMAS PERGANDE; 321, D Street, S.W., Washington (D.C.), U.S.A., January 21, 1882.

NOTES FROM CURRENT ENTOMOLOGICAL LITERATURE.

Entomological Anatomy.—There appears in 'Psyche' (vol. iii., No. 87), by Mr. George Dimmock, of Cambridge, Mass., a carefully prepared paper upon the "Anatomy of the Mouth-Parts of the Suctorial apparatus of *Culex*," with a plate illustrating the parts under discussion. This paper is founded upon one, more elaborate, communicated by Mr. Dimmock to the University of Leipzic. Those of our readers who wish to make a nearer acquaintance with the—happily rare in this country—mosquito, will find in Mr. Dimmock's paper much to interest them. The drawings of the anatomical preparations are excellently rendered.

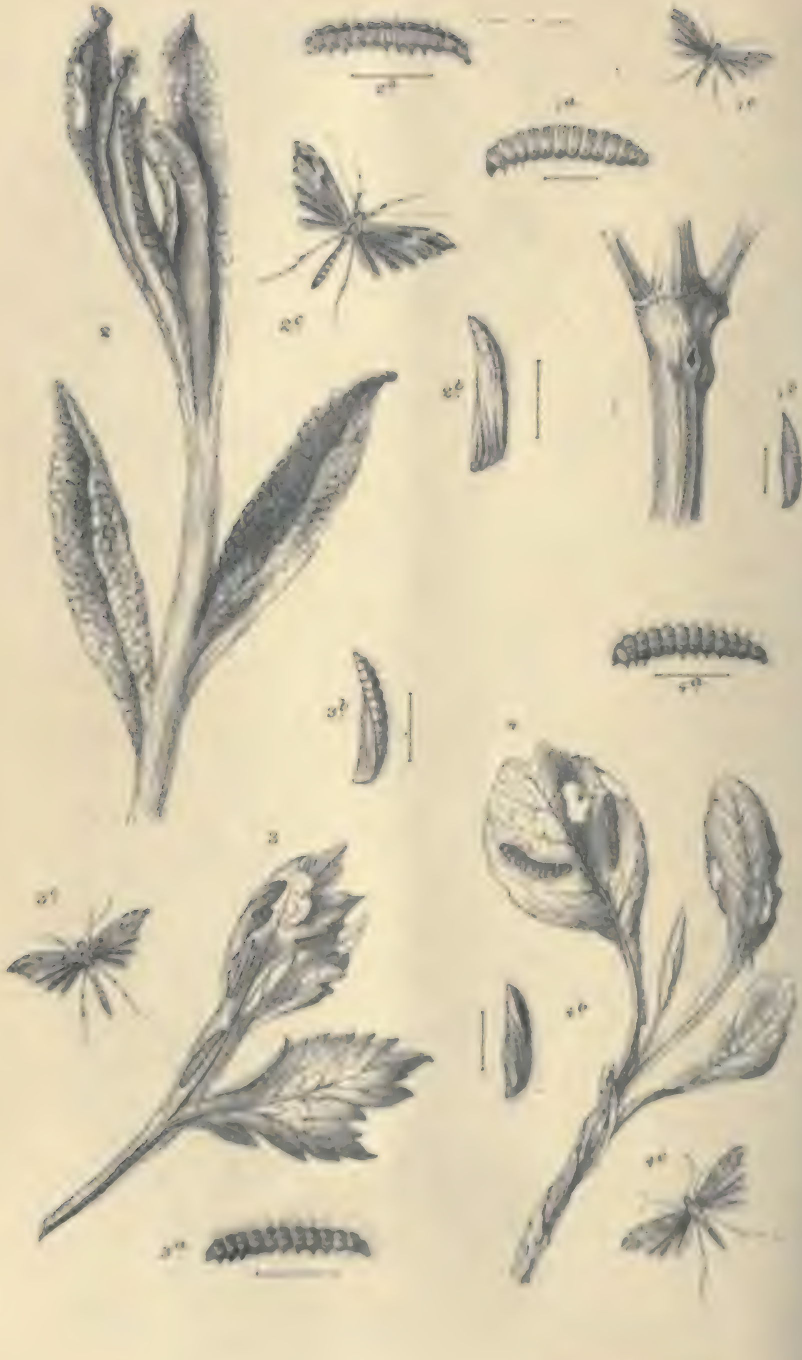
Exotic Lepidoptera.—In the 'Annals and Magazine of Natural History,' (vol. ix., 5th series, p. 84), Mr. Arthur G. Butler, F.L.S., &c., refers to a small collection of Lepidoptera from Melbourne, collected in that part of Australia by Dr. T. P. Lucas. Several of the species described are new to Science. In the same volume of 'Annals and Magazine of Natural History,' p. 206, Mr. Butler also gives the results of an examination of a collection made by Lieut.-Col. C. Swinhoe, chiefly near Candahar. There were forty-one species. Of the ubiquitous *Pyrameis cardui*, Col. Swinhoe says it occurs in the gardens about Candahar in regular swarms in March and April, and in great numbers again in October and November. Mr. Butler notes that the Afghan specimens appear smaller than their European types.

Moths attracted by Falling Water.—Upon this subject Mr. J. Starkie Gardner, writing recently to 'Nature,' (vol. xxv., p. 436), says,—"Whilst watching the great horse-shoe falls of the Skjalfandafljot near Ljosavatn in Iceland, I saw moth after moth fly deliberately into the falling water and disappear. Some which I noticed arriving from a distance fluttered at first deviously, but as they neared the water flew straight in. The gleaming falls seemed at least as attractive as artificial light, and if the fact has not been observed in this country, I should suppose it is because the moths likely to be attracted fly by night, whilst in Northern Iceland there is no night during the summer. The preference trout show for pools near falls is more likely to arise from the extra food they find there than from the more aërated state of the water. The latter supposition, seeing the number of species of lake trout, always seemed to me a lame one, invented for want of a better, whilst the former explains why broken water is always inhabited by insectivorous fishes. The instinct of self-destruction in moths must be older than the introduction of artificial light, and cannot be of use exclusively to collectors, but though its benefits to salmon and trout are obvious enough, its advantages to the moths are not so apparent, unless this self-destruction checks an increase that otherwise would be disadvantageous.

American Ants.—'The Honey Ants of the Garden of the Gods, and the Occident Ants of the American Plains' is the title of a book lately published in Philadelphia (Lippincott & Co.), the author being Henry C. McCook, D.D. The work, which is illustrated by thirteen plates, forms a very valuable contribution to our knowledge of this group of the aculeate Hymenoptera. The importance of Dr. McCook's work deserves more notice than can be given on this page, and those naturalists who have as yet paid little attention to the interesting insects studied by the author, will find much pleasure in perusing his account of these American ants.

J. T. C.

Entomologist May 1882. Plate 2.



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THE ENTOMOLOGIST.

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CHARLES ROBERT DARWIN.

Obituary Notice.

To write an obituary notice of so great and so well-known a man as the late Mr. Darwin seems to be almost a work of supererogation, but we cannot let his death pass without reminding our readers of some of the work so quietly, yet so successfully, accomplished by him who was at once the most modest, and probably the greatest, naturalist who ever lived.

Mr. Darwin was the son of Robert Waring Darwin, F.R.S., a physician at Shrewsbury, his mother being a daughter of the celebrated Josiah Wedgwood. His grandfather, Dr. Erasmus Darwin, was in his time much celebrated as a scientific worker and poet, he also being a Fellow of the Royal Society. It may be said that the very teaching of descent of Mr. Darwin was exemplified in himself, and that in him was inherited his ancestor's ability and scientific tastes, but to be amplified and strengthened.

The Rev. Dr. Butler, afterwards Bishop of Lichfield, was Mr. Darwin's schoolmaster at Shrewsbury School. Following the example of his grandfather, he went, in 1825, to Edinburgh University. Here he was much interested in marine zoology, and in 1826 read, before the Plinian Society in that city, which was at the time one of the chief literary debating clubs, probably his first scientific paper, on the ova of *Flustra*, one of the Polyzoa. Having left the northern classic city, Mr. Darwin next went to Cambridge, attaching himself to Christ's College, where, in 1831, he took his Bachelor's degree. In those days, when scientific study was of little avail in helping a man towards his university degrees, Mr. Darwin was too much occupied with biological work to obtain distinction in the calendar, but in 1837 he obtained his M.A. In 1877, however, when the former student at Christ's had become the greatest naturalist of the age, Cambridge tardily conferred on him her Honorary Doctorate of Laws.

In his youth, it is said, Mr. Darwin was attached to field sports, fox-hunting among them. It was possibly during this period of outdoor exercise that much of the acute observation of natural objects, which he afterwards developed, had its foundation.

Mr. Darwin's natural modesty made the future intellectual giant, in his early manhood, but little known, and then only to a small circle of friends. They, however, soon discovered his exceptional talents, and when the Hon. Captain, afterwards celebrated Admiral, Fitzroy took command of the surveying vessels, 'Adventure' and 'Beagle,' young Darwin was selected to accompany the latter vessel as naturalist to the expedition, which sailed on the 27th December, 1831. Nor was Mr. Darwin in this work simply a hireling, for he received no remuneration, and even contributed his own share of the expense in the four years' voyage. This was not all, for he amassed fine collections, a great part of which, on his return, he freely gave and distributed amongst those specialists who were interested in various branches of Natural History. The results were published between 1839 and 1842 in official form, but edited by Mr. Darwin himself, with special remarks on the habits of animals from his own pen. In this work he was assisted by Professor Owen, Mr. Bell, Mr. Waterhouse, and others. The country chiefly visited on this voyage was the coast of South America, from Buenos Ayres through the Straits of Magellan to Valparaiso. His observations were, however, much extended, and included the Galapagos, Australia, and many other places visited by the ships in their circumnavigation. As a result of this voyage Mr. Darwin's name will be handed down to posterity in North Australia at Port Darwin, while in Tierra del Fuego are also named after him a mountain and a sound. It was not, however, all happiness with the subject of this memoir during his protracted voyage, for Mr. Darwin suffered almost constantly from sea-sickness, which in his case became chronic, and even in long after years, when far from the rolling billows which had formerly tormented him, his old enemy would return as though he were again at sea. In 1839 was published his account of the expedition, the well-known and even now popular, 'Journal of a Naturalist.' It is needless to refer to that which we suppose has been perused by all our readers.

The first really original work of Mr. Darwin's was published in 1842, being his 'Structure and Distribution of Coral Reefs.' This was followed at intervals by other volumes, all of which are standard works. Amongst these was a paper, soon after his return, 'On the Formation of Vegetable Mould,' from observations commenced some time previously, and these culminated in one of his latest published works on 'Earthworms,' which caused at the time of its issue so much interest, even in circles who take little heed of scientific matters.

The great work amongst the many which have appeared from the industrious mind of this great author, and the one by which he will be best known in posterity, is his 'Origin of Species by means of Natural Selection.' When first issued it was received by many with positive horror, and was generally decried, but happily Mr. Darwin lived long enough to see his masterpiece the accepted doctrine amongst naturalists generally, and his followers, from being counted by tens, to be enumerated by tens of thousands, all over the civilised world. It is impossible to know how far the influence of the train of thought propounded in that volume has extended. New forms and methods of study in Natural Sciences emanated. Students became more methodical, and with a more settled plan in their work. The embryology of various animals has become of the utmost interest, and we may say generally that the teachings of Darwin have directly or indirectly influenced the present system of all scientific work.

To the readers of this magazine some of his works especially appeal, such as his 'Insectivorous Plants,' 'Fertilisation of Orchids,' &c.

After the protracted voyage of discovery, which was the great event in an otherwise quiet life, and which was the cause of a long period of broken health and patient suffering, Mr. Darwin settled at Down, leading the life of a country squire to all outward appearance. He was a magistrate of the county of Kent. Shortly before taking up his residence at Down he married his cousin, Miss Emma Wedgwood, their family consisting of five sons and two daughters. His son, Mr. Francis Darwin, latterly acted as his father's literary secretary and almost constant companion. He also bids fair to continue to a fourth generation that scientific ability which has characterised his ancestors.

In personal habits Mr. Darwin was of the simplest, retiring to rest at ten, and up at five to his beloved work. He seldom left the grounds surrounding his house even for a stroll in the adjoining village. His modesty was such that he never seemed to realise that he had done great or exceptional work. Scientific honours, of course, came thick and numerous. He was a Fellow of the Royal and Linnean Societies, and either honorary or corresponding member of nearly every leading scientific society in the world. He was an original member of the Entomological Society of London. But it seems disappointing that in his own country his ability was never recognised by title or distinction from his sovereign, although, after all, this might have been distasteful to one of such simple tastes.

The Linnean Society is to be congratulated upon having obtained the last, and fortunately the best, portrait of Mr. Darwin, which is painted in oil by Mr. John Collier, and only completed a few weeks ago. It will probably be hung in this year's Academy Exhibition, and is altogether a most pleasing likeness.

Born at Shrewsbury, February 12th, 1809, Mr. Darwin died at his residence at Down, near Beckenham, Kent, April 19th, 1882, in the 74th year of his age. His death was sudden and somewhat unexpected. It was known that he had long suffered from weak action of the heart, but he was engaged at his favourite studies even up to the day before he died, and remained quite conscious up to within a quarter of an hour of the time when he closed his long and memorable life as peacefully as if in sleep. So ended the career of a man who in future generations will be compared with the greatest minds, even to Socrates and the oldest philosophers.

J. T. C.

April 20th, 1882.

P.S.—Since writing the foregoing it has been decided that Mr. Darwin shall be buried in Westminster Abbey, where will be conducted a funeral of the greatest simplicity. His resting-place will be near to that of another great original thinker, Sir Isaac Newton.

Appended are a few lines from the pen of Mr. J. Jenner Weir.

On April 19th there passed away from amongst us the greatest naturalist that this and probably any century has produced.

The writer of this notice has engaged in the pursuit of Natural History for as many years prior to the appearance of 'The Origin of Species by means of Natural Selection' as have elapsed since that work appeared, and has been profoundly impressed by the totally altered aspect which all the phenomena of Nature have presented to most minds, since by that publication a great flood of light has been thrown on the previously hazy doctrine of the evolution of species. For instance, entomologists had constantly found moths with one or two pollen masses of an orchid firmly glued to the base of their trunks, and insects had been often exhibited at the meetings of the Entomological Society, and, after examination, had been simply pronounced "curious," but no deep significance was attached to the fact.

When Mr. Darwin, in 1862, produced his great work on the 'Fertilisation of Orchids,' it appeared that these curious flowers were so shaped as to give a landing-stage to the insect, and the nectar-tube so arranged that the honey could only be reached by the insect pressing against the pollen masses, and causing them to be fixed to the head or trunk in the exact position they should occupy to effect the fertilisation of the next flower visited. Thus other flowers were discovered that could be fertilised by one species of insect only, as the *Yucca* by *Pronuba yuccasella;* this insect has the legs modified so as to enable it to convey the pollen from one flower to another.

How many Lepidoptera are well known to entomologists, belonging to the same genus or to allied genera, which have almost precisely similar markings; on the doctrine of sphæroid creation these resemblances were inexplicable, but on the theory of a common origin, with modifications brought about by natural selection, no difficulty is presented.

It is not too much to say that Mr. Darwin has, by his contributions to the study of Natural Sciences, completely revolutionised research, which will bear fruit so long as that study is pursued.

The writer of this notice is too much affected by the loss he has sustained of the dearest and most esteemed personal friend, and must conclude with an extract from 'The Times' of April 21st, to the truth of which he can amply testify. That paper, speaking of Mr. Darwin, says :—"His habits and manners were of child-like simplicity, his bearing of the most winning geniality, and his modesty and evident unconsciousnesss of his own greatness phenomenal."

CONTRIBUTIONS TO THE HISTORY OF THE BRITISH *PTEROPHORI.*

By Richard South.

(Continued from p. 31.)

It being impossible to obtain drawings of the life-histories of all the British "plumes" in a single season, such species as have been figured will be dealt with without any attempt to follow the arrangement of our list of the insects in this group. May I again be permitted to ask the assistance of the readers of the 'Entomologist' in obtaining the necessary material for a speedy completion of this series of articles?

Leioptilus, Wallgn.

Microdactylus, Hub.

(Plate II., Fig. 1.)

Imago.—Expanse, 6–7 lines. Fore wing, ground colour very pale sulphur, sprinkled with blackish scales; a blackish spot on the costa, and a smaller one below it, just before the digital juncture; towards the apex of wing is an indistinct brownish cloud, in which is another small blackish spot: this latter is not constant. Three minute blackish dots on the hind margin of inner digit. Fringes pale grey. Tip of outer digit acute. Hind wing pale grey, with a pinksih tinge. Head, thorax, and body, pale sulphur. May and June.

Larva.—Length about 4 lines, slightly attenuated towards anal extremity. Head pale brown, with a yellowish tinge; the notched crown is slightly freckled with darker, the mandibles are dark brown or blackish, and there is a black spot on each cheek. Ground colour yellowish white, a series of quadrate patches of brown dots form the dorsal stripe, darker on the 12th and 13th segments. A few short bristles along the dorsal and subdorsal areas; those on the 12th and 13th segments are slightly darker. A row of black dots along the spiracular area, indistinct or altogether wanting on the 3rd and 4th segments. Prolegs tipped with brown, and the upper portion of anal claspers spotted with black. Food, *Eupatorium cannabinum*. Feeds on the flowers.

PUPA.—Dingy yellowish green, the dorsal area slightly darker; upper portion of head blackish, as are also the eyes and anal point of body, which latter is rounded; tip of wing-cases detached.

Plate II., fig. 1, hemp agrimony (*Eupatorium cannatinum*(; 1*a*, larva; 1*b*, pupa: 1*c*, imago of *L. microdactylus.*

The description given is that of the hybernating larva, for a supply of which I have to thank Mr. Eedle. I have not had an opportunity of seeing a *feeding* larva yet.

The larva hybernates in branches or stems of its food-plant, the common hemp agrimony. It makes a hole just below one of the joints, and gnaws it way upwards for about half an inch above the joint; here it prepares a snug chamber, in which it remains as a larva until April, when it turns to a pupa. When, as sometimes happens, a larva pierces the stem *midway* between the joints, a slight thickening of the skin, &c., is observed just above the hole.

ŒDEMATOPHORUS, Wallgn.

Lithodactylus, Tr.

Similidactylus, Dale.

(PLATE II., FIG. 2.)

IMAGO.—Expanse, 12–14 lines. Fore wing whitish grey, sometimes so thickly powdered with brown scales as to appear of a uniform grey-brown colour; freshly disclosed specimens exhibit a slight rosy tinge in certain lights. The costa is narrowly margined with dark brown to just beyond the middle, where is situated a blackish linear spot, from the hinder edge of which a whitish line runs to the middle of the wing, terminating between two blackish spots at the digital juncture; the outer spot situated near the juncture is of small size, and not always clearly defined. In some examples the costal spot and the largest juncture spot are connected by a blackish shade; in such instances the whitish line is hardly to be traced. Tip of outer digit pointed, and very slightly hooked. Fringes grey-brown, with darker scales, more especially at the angle of outer and tip and angle of inner digits. Hind wings dark grey-brown; fringes dark grey. Head and thorax whitish grey. Abdominal juncture whitish. July and August.

Larva.—Length, 6–7 lines, slightly attenuated posteriorly. Head a little smaller than 2nd segment, pale yellowish brown; crown freckled with olive-brown; a black spot on each cheek: mandibles pale reddish brown. Ground colour yellowish green. Dorsal stripe from 4th to 13th segments broad pinkish, its outer edges of a deeper tint, approaching violet, and narrowly bordered with whitish: there is also a yellowish median line, bordered with dark green; this line commences on the 3rd segment. The pinkish dorsal stripe is not assumed until the last moult, but the medio-dorsal line of the adult is present from its earliest stage. Two dorsal rows of tubercles (four on each segment) are situated on the outer edge of dorsal stripe, pinkish, each with a tuft of moderately long pale grey hairs; subdorsal, one whitish wart with a tuft of short whitish hairs on the middle of each segment, and a smaller one with a single whitish hair a little below and situated on the posterior edge of segment: spiracular area has two warts on each segment, the anterior of which is semitransparent; it is also larger than its fellow, and the hairs emitted therefrom are longer. All the egs ar e semitransparent, with a green tinge. Anal claspers tinged with pale brown. Food, *Inula dysenterica*. In the terminal shoots when young, after the manner of a Tortrix larva; later, on the upper surface of the leaves. Occurs in June.

Pupa.—Upper part hairy like the larva, colour whitish, much streaked with dark olive-green laterally; dorsal line whitish, finely bordered with dark grey; wing-cases yellowish green; antennæ and legs showing up darker; a pinkish tinge just above the wing-cases. July.

Plate II., fig. 2, fleabane (*Inula dysenterica*); 2*a*, larva; 2*b*, pupa; 2*c*, imago of *Œ. lithodactylus*.

When fleabane (*Inula dysenterica*) is making its appearance the unfolding and proper development of some of the shoots, especially terminal ones, appear impeded; examination will in all probability show the check to be due to the presence of young *Œ. lithodactylus* larvæ. This is the best time to secure them, as they are now almost certain to be free from parasites. Later, the larvæ may be found on the upper sides of the expanded leaves, if looked for just after dark. Patches of the fleshy part of the leaf are eaten away, exposing the skeleton, and rendering the plants infested very conspicuous objects. This species is said to feed also upon *Conyza squarrosa* in a like manner.

LEIOPTILUS, Wallgn.

Lienigianus, Zell.

(PLATE II., FIG. 3.)

IMAGO.—Expanse, 9–10 lines. Ground colour of fore wing whitish brown, more or less tinged with ochreous, and sparingly dusted with blackish scales. On the costa are two conspicuous dark brown or blackish linear spots, and at the angle of outer digit is a smaller blackish dot, not always distinct. In close proximity to the digital juncture is a dark brown or blackish linear dash; sometimes this mark is contracted in the middle; between it and the base of the wing is a small blackish dot. Fringes grey-brown; digital margins darker. Tip of outer digit acute. Hind wing grey-brown. Head ochreous brown; thorax and abdominal juncture whitish. July.

LARVA.—Length 5 lines, attenuated towards both ends. Head shining pale greenish brown; mandibles pale reddish brown; crown and spot on each cheek darker brown. Ground colour whitish green; segmental divisions paler. Dorsal stripe narrow, a shade darker than the ground colour, with a very slender whitish median line. Subdorsal stripe narrow interrupted yellowish green. Tubercles, two dorsal rows (two on each segment), whitish, with several moderately long whitish hairs; subdorsal, a row of smaller warts whitish, with two or three short whitish hairs, and situated a little towards anterior edge of segment; spiracular, one wart on each segment, semitransparent, with a greenish tinge; tuft of hair moderately long. Prolegs and anal claspers shining pale greenish brown, with darker brown markings. Food, *Artemisia vulgaris*, on the terminal leaves eating away the fleshy part and leaving the skeleton. May and June.

PUPA.—Whitish green, with a fine yellowish line down the centre of back, and a few oblique dark dorsal markings; warts and hairs similar to those of larva. The oblique markings vary in intensity, sometimes giving the whole dorsal area a brown coloration; wing-cases green; antennæ and legs darker anteriorly. Sometimes the upper part of the pupa is yellowish, with a pink tinge, and the oblique stripes reddish brown. Fixed by tail to under side of leaf of mugwort, the food-plant, looking not unlike the larva at rest. June.

Plate II., fig. 3, mugwort (*Artemisia vulgaris*); 3 *a*, larva; 3 *b*, pupa; 3 *c*, imago of *L. Lienigianus*.

I am indebted to Mr. Sydney Webb for an opportunity of rearing and describing the larva of this local species. Last year, not far from Instowe, North Devon, I met with a large patch of mugwort, when the terminal leaves of many of the plants showed signs of having been fed on in the manner of *L. Lienigianus*, but I did not find the insect in any stage.

LEIOPTILUS, Wallgn.

Tephradactylus, Hub.

(PLATE II., FIG. 4.)

IMAGO.—Expanse, 8–9 lines. Ground colour of fore wing whitish brown, thickly sprinkled with dark grey scales, giving an ashy appearance to the whole wing. Before the digital juncture are two small blackish dots, that nearest the costa being slightly the largest. On the outer digit, near the tip, are three small blackish dots arranged in a triangle. There are also three blackish dots on the hind margin of inner digit. Fringes grey. Tip of outer digit subacute. Hind wing grey-brown; fringes slightly paler. Head and thorax whitish grey. Body pale yellowish grey, with darker dorsal markings. June and July.

LARVA.—Length, 5 lines, attenuated at both ends. Head shining pale yellowish brown; mandibles reddish brown; spot on each cheek black. Ground colour green, with more or less of a yellowish tinge. Dorsal stripe whitish, with a median area darker than ground colour. Subdorsal line wavy interrupted yellowish. Tubercles, dorsal, two rows (four on each segment), whitish, with tufts of whitish hairs; one hair from each of the posterior warts longer than the rest, and the tip slightly reflexed. Subdorsal, a row of small warts each with a single whitish hair. Spiracle region, on the middle of each segment is a semitransparent wart, with a tuft of moderately long whitish hairs; and just above, on the posterior edge of segment, is a smaller one, with short whitish hairs. Legs yellowish green. Food, golden rod (*Solidago virgaurea*), when young, boring into the shoots; afterwards eats holes in the expanded leaves. May and June.

PUPA.—Greenish, with warts and hairs as in larval stage; an olive-green stripe immediately under the dorsal row of tubercles, and under this again is a pinkish shade. Wing-cases pale green, with a lateral fringe of white hairs. Attached by the anal segment, head downwards, to the stems of food-plant or sides of cage in confinement. June and July.

Fig. 4, golden rod (*Solidago virgaurea*); 4 *a*, larva; 4 *b*, pupa; 4 *c*, imago of *L. tephradactylus*.

The imago of *Leioptilus tephradactylus* runs very close to that of *L. Lienigianus* in structure and coloration; but the absence of the costal spots at once separates it from the latter species.

Young hybernated larvæ may be found as soon as the food-plant is above ground, eating the tender shoots, often three or four larvæ on one shoot. They are then about the size of a larva of *Arctia mendica* just emerged from the egg, and in colour whitish, with long grey hairs.

On sunny days the larva rests on the lower part of stem or under a leaf, but on dull days seems to feed at intervals all day.

(To be continued.)

NATURAL LOCALITIES OF BRITISH COLEOPTERA.

By Rev. W. W. Fowler, M.A., F.L.S.

No. III.—OUR GARDENS AND ROADS.

Before proceeding farther afield it will be as well to consider what may be found in our own gardens. Of course this will largely depend upon the sort of garden we possess, its soil, situation, &c.; we may, however, safely say that there is no garden in which rare species may not at one time or other be found. Some rare species, such as *Crioceris merdigera*, which is found in lily-flowers, appear to be confined to gardens; and there are other less rare beetles, such as *Crioceris asparagi*, *Halticæ* of various species, and others which are more or less attached to cultivated plants, that naturally are found in the spots where the plants are grown. Good series, however, of many species may often be taken close to one's own doors; last year, for instance, I took *Meligethes pedicularius* abundantly, and *M. erythropus* occasionally, in the bloom of my strawberry plants. Old trees and stumps in gardens are often very productive. In one garden at Stockwell, some years ago, *Megapenthes sanguinicollis*, *M. lugens*, *Eryx atra*, and *Xylophilus populneus*, all fell in this way to the lot of a fortunate collector. The chief advantage of a garden, however, is the ease and safety with which traps can be set in it. One of the best traps for Coleoptera is a heap of cut grass, which is always forthcoming where there is the smallest piece of lawn. The amount of beetles of all genera to be found in such a heap on a hot day is surprising; and even in winter it is almost always profitable. *Philonthi* and *Homalotæ* literally swarm; and *Oxypodæ*, *Oligotæ*, *Xantholini*, *Steni*, *Euplecti*, *Monotomæ*, *Atomariæ*, *Histeridæ*, *Trichopterygidæ*, *Clambidæ*, and many others are almost equally abundant. The cut grass is perhaps more productive if placed round a hot-bed, if there be one in the garden. From no locality, perhaps, can more species be obtained than from a hot-bed, if worked carefully all the year round. I have chiefly worked hot-beds for *Trichopterygidæ*, and have taken the following from two or three in different localities:—*Trichopteryx atomaria*, *T. lata*, *T. sericans*, *T. Montadoni*, *T. brevis*, *T. anthracina*, *T. longula*, *T. Chevrolati*, *T. rivularis*, *Actidium coarctatum*, *Millidium trisulcatum*, *Nephanes*

Titan, *Ptilium foveolatum*, *Pteridium apicale* (the most abundant beetle at all seasons of the year, the next perhaps being *Acritus minutus*), and one or two other species that may perhaps prove new to Science. This list will serve to show what may be obtained from a hot-bed, as other groups are equally abundant. It is a very good plan to put a little moss in a corner of the hot-bed, and examine it from day to day. It will also be found very productive to examine the under side of the glass some time after the plants have been watered and the frame closed. When the steam has condensed in thick drops on the under surface, a great number of beetles are always flying from the inside of the frame to the light, and get stuck in the water. It is astonishing what large species (*Oxyteli*, &c.) may be found in this way, besides the minuter species. Boards placed round the bed, if examined on hot days, are often found to have good beetles adhering to their under sides. In autumn, when the heat has more or less left the bed, good species may be found in the manure and grass round the edge. I have taken *Philonthus thermarum*, good *Cryptophagi*, and other things, which I have not seen earlier in the year. Even in winter, it is a very rare thing to find a hot-bed wholly unproductive; in fact, sometimes more species may be obtained then than at other times, as the slight warmth left is a great attraction to hybernating Coleoptera. In the warm days of spring these beetles come out in great abundance, and may be seen flying over the manure; and both at this time and in the hot days of summer promiscuous working with the sweeping-net backwards and forwards over the bed will produce many good beetles, the various species of the very rare genus *Euthia* being perhaps the best that have been taken in this way. A list of the species to be procured from grass and hot-beds would take up too much space for our paper, but I can only advise any collector who is studying the minuter groups to leave no frame untouched that he can get access to. Beginners had better not spend too much time over them, as very many of the species are difficult to set properly, and hard to determine; after the experience of a year or two, however, a season almost entirely given up to hot-bed collecting will amply repay any collector.

A very fair collection of beetles for a beginner may be made from pavements, roads, and pathways,; the whiter the better.

Even the most casual observer must have noticed the swarms of insects that are seen glancing about in the sun during the warm days of spring. On examination these will be found to consist of a large proportion of *Amaræ* (chiefly *A. trivialis* and *A. familiaris*), *Philonthi*, and *Xantholini;* but mingled with these will be found many other species, *Cercyons*, *Aphodii*, *Homalotæ*, and many species of *Curculionidæ* being perhaps the commonest. The first beetle to be seen running on every pathway in spring and the last to disappear on the approach of winter is the active little *Notiophilus biguttatus*, which is common everywhere. The *Carabi* are common, but, as they usually roam about in search of prey by night and keep quiet by day, they are generally found crushed by the feet of passers-by. *Pterostichi*, *Harpali*, and *Staphylini* proper are also fond of roads. Of course almost any beetle whatever may be found in such a situation, but some are found so commonly that roads and pavements may be almost considered their peculiar locality. Among these is *Coprophilus striatulus*, which I have never found under any other conditions; it is very abundant on the Lincoln pavement in spring; this year I met with it as early as the 19th of March.

In chalky districts, especially in the south, collectors should keep a sharp look-out for rare species. At Hastings, or Deal, or the neighbouring places, *Calosoma sycophanta*, or even *Diachromus germanus* may at any time fall to their lot. The former beetle has, I believe, been taken not long ago in the streets of Plymouth. *Carabus auratus* may perhaps be picked up in the street outside Covent Garden Market, its claim to being indigenous resting on the fact that it has walked out of a bundle of cabbages or radishes of presumably foreign origin. Sometimes a good species may be taken flying over roads. I remember hearing of *Onthophagus taurus* having been taken by a collector who drove along the roads at dusk, sweeping a net backwards and forwards in the air as he went along. My friend Mr. Mason, of Burton-on-Trent, not long ago knocked a beetle down in the road as he was walking along, which proved to be a fine *Odontæus mobilicornis*. Of course all these captures may with reason be called "accidents"; but it is well to be on the look-out for such "accidents," and to be provided against them: no collector should go unprovided with a small tube or tin match-box, as at any time, when he least expects it, a good species may turn up.

Even in London, good *Staphylinidæ* have been found on the pavements, some of the best in the courtyard of the British Museum itself.

All pools and puddles in roads, especially old ones in deep ruts, should be examined. Mr. J. J. Walker—who did so much for British Coleoptera before he went abroad, and whose liberality was so extensive (for he kept no collection, but sent all his numberless captures to his friends)—once took in a single haul, besides commoner species, the following:—*Homalota hepatica*, *Anisotoma dubia*, *A. badia*, *Cyrtusa pauxilla*, *Amphicyllis globus*, *Orobitis cyaneus*, *Chrysomela varians*, *Psylliodes dulcamaræ*, and *Mniophila muscorum*.

The School House, Lincoln, April, 1882.

DICRORAMPHA DISTINCTANA, HEIN.

A SPECIES ADDED TO THE BRITISH FAUNA.

By Richard South.

The *Dicrorampha* I captured in North Devonshire last year, and which was figured in vol. xiv. of the 'Entomologist,' Plate I., fig. 15, and referred to at p. 60 of this volume, has been identified by Mr. C. G. Barrett as *D. distinctana* of Heinemann.

This addition to our fauna is interesting, but will add somewhat to the difficulty already existing in the satisfactory identification of the species in this perplexing genus.

Dicrorampha distinctana is nearly allied to *D. consortana*, but may be distinguished therefrom by its larger size, and by the brighter and more clearly defined whitish blotch on the inner margin.

This is evidently a rare species, as Mr. Barrett informs me that it has only been taken by Herr Heinemann near Vienna.

I only met with two specimens; both were taken on the same day early in July, and within a few paces of each other, as they were flying over herbage in the afternoon.

12, Abbey Gardens, St. John's Wood, N.W., April 15, 1882.

BRITISH LEPIDOPTERA.

By John T. Carrington, F.L.S.

I well remember, on my first visit to an entomological society, now well nigh twenty-five years ago, being interested in a somewhat acrid discussion on the merits of the claim of a certain specimen of a lepidopterous insect—*Catocala fraxini* I think was the creature—to be considered "British." Arguments were then briskly used which since that time one has heard so frequently as to place them amongst the group of subjects we are apt to consider "hackneyed."

The cause of my penning these lines was my accidental overhearing a recent conversation between two lepidopterists, of how a certain collector of "British" moths and butterflies had made arrangements for the coming season, to import certain species which are considered rare and therefore valuable if captured in this country. These were to be obtained, in the earlier forms of the various species, from Germany or France, and deliberately passed off as British subjects of her Majesty the Queen. This collector's object, in committing so deliberate and contemptible a fraud, was stated to be, "to bring down the prices of the dealers." Amongst the species enumerated were *Geometra smaragdaria*, *Boletobia fuliginaria*, and—mark the entomological knowledge of our so-called entomologist—*Agrotis Ashworthii!*

Like a certain French gentleman in South Africa, of whom we have heard, on hearing this conversation "I felt sad," and probably for the first time began really to think what would be the effect of the nefarious operations of this self-constituted immigration agent, who, by the way, would not on any account *sell* an insect—if he thought he should be found out.

The question seems to resolve itself into this, that certain Englishmen are in the habit of studying the insular insect fauna of Great Britain and Ireland. Possibly because they have little opportunity of obtaining, and less of observing in a state of nature, the insects from the remainder of the Palæarctic region, so they confine their attentions to the more limited district of their native country. Probably from some points of view this is altogether unscientific, and those who conduct their studies in this manner should be classed with certain collectors known in amateur art circles; but another question arises: Have these gentlemen a right to confine themselves to working out their own fauna? I cannot help thinking that they have not only a perfect right, but that it has been even an advantage to the science of Entomology that this sytem of insular study should be followed, for, at least in this part of the Palæarctic region, the insects are as well known and perhaps better understood than elsewhere in any equal extent of country in the same region, notwithstanding our habit of sending abroad our obscure species to be named. This will probably be considered, by some of the readers of the 'Entomologist,' to be an egotistical statement, but I venture to differ with those who think so. To continue the question of British insect-collecting. As a large number of collectors work a limited fauna, the rarer insects of that fauna naturally soon command a certain market value. As the number of persons interested in the subject increases, so does the value of the particular species most wanted. It is all very well for some people to say that a species is only a species, no matter whence it comes; but for really scientific research it does matter very much if one's specimens from the Shetlands get mixed with those from the Amoor Valley, and we forget which is which. Another reason that certain moths command a larger value than others, is that they are obtained in remote parts of this kingdom by persons who have made it their business to remain in those remote places whole seasons, at considerable expense of time and money, while to most of those who study our beloved science, loss of the former alone makes collecting in such out-of-the-way places impossible. Allowing then, that *bonâ fide* British specimens of certain or all species have a right to certain monetary value, then comes another point of view, *viz.*, to those who have tolerably complete collections of British insects. Many of these have, at great personal cost and in many cases much self-denial, obtained that which, were it a collection of some article of vertu, would be considered amongst a man's estate when he dies, and be realized at a time when his capital is most wanted by his survivors. If we are to permit unprincipled collectors to fraudulently palm off spurious articles upon us, they render our collections only equally valuable with those of the collector who obtains butterflies from all parts of the world, sticks a pin through them, places them in his beautiful cabinet drawers, without even localities or date attached, simply because they are pretty!

As arguments have usually two sides, we will now consider the other part of this question, *viz.*, the more extended study by British entomologists of the whole Palæarctic fauna, of which that of our islands only forms a part. That this more extended study is desirable no one can for a moment deny, and it is even probable that most English entomologists *will* extend their observations to other localities than our own country, as they require other worlds to conquer. Then will the "European" collection increase in value just at the same rate as our British, when there is a market demand for identified specimens required. So far from the dealers being shorn of their profits, they will still have rare insects, and even more valuable local forms, to sell. Now—as the intending student of the Lepidoptera of the Palæarctic region will soon find—certain insects from Siberia or the Amoor command in Paris or Berlin quite as high a price as do any British species in London. Again, it is possible at the present time to obtain for British local forms, or exclusively British species, a higher price in the first-named cities than in our own well-known sale-room near Covent Garden.

It seems to be an uncharitable fashion amongst some people to sneer at "the dealers," while they forget what we owe to those who have made it their business and pleasure to visit corners of this country, which would require the whole of some people's annual holiday to reach and return, without even unfolding the net. How then could we expect to know many local forms recently introduced to us, but for the energy of "dealers?" That there are unprincipled dealers in moths is to be expected, as much as in any other article, but it is for the buyer to use his own judgment as in everything else. I suppose there are still people who intend to make collections and study certain branches of Entomology entirely by their own industrious efforts; but if a man really means to know his subject, he will soon find that his own limited collection is of little use without the aid of exchange, or purchase, to obtain the subjects for comparison.

What I have written will by some be probably considered neither more nor less than heresy, but after all, what is the Entomology of our best entomologists than a mere system of observation, description, and naming of our insects? Who has systematically worked the comparative embryology and probable derivation of our species of insects? Why should *Acronycta* *tridens* and *Acronycta psi* be so extremely difficult to separate as imagines, but so distinct as larvæ? How many of us know anything of the structure of the ova of insects, or why insects come to sugar one night and not another? No, we are, after all, collectors, only in different degrees.

The time will come, if we keep our insect fauna pure and unmixed, when it will be of great value to naturalists in unravelling the mystery of the great plan of Nature, simply on account of our insular position. Where else in this geographical region can the same extent of locality be found, on which various insects have for countless generations been propagated without admixture of "improving strains"? Even this has been suggested by those who only are fit to breed fancy pigeons, and that we should get European pupæ, and put them down in places where local insects occur, "to improve the breed!"

I think many will agree with me in the opinion, that if a man chooses to study the insect fauna of any particular group of islands, or geographical catchment basin, or even his native county, he has a right to do so; and if any man, directly or indirectly, palms off a specimen which was captured in Kent, upon the student who is working the fauna of Sussex, that man commits a deliberate fraud, and should be treated with the contempt he deserves, if with nothing worse.

Royal Aquarium, Westminster, S.W., April 23, 1882.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Funeral of the late Mr. Darwin.—The Abbey of Westminster was this day densely filled, although the admission was strictly by ticket, with those who attended to show their respect to the great man of Science now lying at rest. The coffin, which was of polished oak,—and bore on a plain brass-plate the inscription, "Charles Robert Darwin, born February 12th, 1809; died April 19th, 1882,—was removed from Down to the Abbey precincts last night. At twelve to-day the procession left the Chapter House, the pall-bearers being the Duke of Devonshire, the Duke of Argyll, Mr. J. R. Lowell (the American Minister), Mr. Spottiswoode (President of the Royal Society), Sir Joseph Hooker, Mr. A. R. Wallace, Professor Huxley, Sir John Lubbock

(President of the Linnean Society), and the Rev. Canon Farrar. Immediately followed the chief mourner and members of the family; after which was a procession of great length, including representatives of Foreign States, the Universities, many Scientific Societies; the Speaker, and a number of members of both Houses of Parliament; and some scores of scientific and other leading men. The coffin was laden with beautiful wreaths of flowers, amongst which was notable one of great beauty, tendered to the memory of Mr. Darwin by some members of the Liverpool Scientific Societies, who were represented by Mr. Isaac C. Thompson, of that city. The choral service was rendered, with the addition of an anthem especially composed for the occasion, by Dr. J. F. Bridge, the words being from Proverbs iii. 13, 15, 16, 17. More appropriate lines could hardly have been combined with music in better taste. After the first part of the service, and as the body was being carried to the grave, the day, already gloomy enough, became still more overcast by a passing cloud, which darkness, combined with the solemn music, added much to the impressive solemnity of the scene. At the close of the service the three to four thousand persons present filed past the grave of him who has found a resting-place amidst the remains of those who possessed the greatest intellect born of this country.—JOHN T. CARRINGTON; April 26th, 1882.

VANESSA ANTIOPA IN DECEMBER.—I have received the following communication from Mr. Walter Haydon, surgeon in the service of the Hudson's Bay Company, stationed at Moose Factory in that dreary region:—"One day in December a thaw came on that lasted two days. Whilst I was in the woods setting a trap I saw a *Vanessa Antiopa*, but could not catch it, as I had no net and the bush was thick; it flew up as a tree I had just felled struck the bushes. I am certain of the species, for I saw it settle, but could not get near enough to make a capture." It would therefore appear that the remarkably mild winter we have had has at any rate partially extended to the northern parts of America.—J. JENNER WEIR; 6, Haddo Villas, Blackheath, S.E., April, 1882.

EFFECT OF TEMPERATURE ON LEPIDOPTERA.—On April 10th, when entomologising at Lewes on a sunny bank sloping to the south, I saw several specimens of *Vanessa urticæ* on the wing. The sun rather suddenly became obscured by a passing cloud; one of the specimens in a few minutes became paralysed by the cold, and fluttered on the ground. Upon disturbing the insect it with difficulty rose and attempted to fly across a small stream, but its strength failed, and it fell with outspread wings into the water. The wind was cold and from the east, but the sun when not obscured was very hot. I never in my experience saw the effect of a change of temperature so immediately apparent. On 8th and 10th April several specimens of both sexes of *Pieris rapæ* and *P. napi* were on the wing, an unusually early appearance of these two species.—J. JENNER WEIR; 6, Haddo Villas, Blackheath, S.E., April 10, 1882.

THE EARLY SEASON. — It would appear that the season is unusually forward. I hear *Leucophasia sinapis*, *Notodonta dictæoides*, and *N. chaonia* have already been taken in the New Forest. *Eupithecia irriguata*, *E. dodoneata*, *E. abbreviata*, *F. nanata*, *E. pumilata*, *Boarmia cinctaria*, and *Hemerophila abruptaria* have also been taken, but the time of their appearance is of course more normal.—A. B. FARN: The Dartons, Dartford, April 19th, 1882.

CAPTURES NEAR ROMSEY.—I may mention that I have taken, during the last two seasons, within a mile of this town, besides numerous commoner species, the following:—*Epione advenaria*, *Eurymene dolabraria*, *Ennomos fuscantaria*, *Boarmia roboraria* and *B. consortaria*, *Camptogramma fluviata*, *Phibalapteryx polygrammata*, *Scotosia undulata*, *Notodonta dictæa*, *N. dictæoides*, *N. trepida*, *N. chaonia*, *N. dodonæa*, *Diphthera Orion*, *Hydræcia petasitis*, a black specimen of *Xylophasia polyodon*, *Luperina cespitis*, *Triphæna subsequa*, *Cirrædia xerampelina*, *Tethea retusa*, and *Catocala promissa*. — EDWARD BUCKELL; Romsey, Hampshire, Nov. 10, 1881.

NOTE ON THE FEMALE OF PHIGALIA PILOSARIA.—In the 'Manual' it is stated that the female of *Phigalia pilosaria* is entirely apterous. A careful examination of specimens of the insect I possess leads to the conclusion that the rudiments of wings in this species are at least as well developed as in *Nyssia hispidaria*.—A. E. HODGSON; Coleford, Glos, April, 1882.

EARLY OCCURRENCE OF NYSSIA ZONARIA AND BOMBYX RUBI. —On February 12th I took a female of the above moth on the Wallasey sand-hills. It is, I believe, about fifty-three years since I first discovered this species on the Cheshire coast, and I have never heard of it being taken so early. I also picked up some larvæ of *Bombyx rubi*, which I think is also exceptionally early for it to be on the move.—NICHOLAS COOKE; Gorsey Hey, Liscard, February 18, 1882.

DESCRIPTION OF THE LARVA OF GALLERIA CERELLA.—The eggs of this species are deposited in July and August on old honeycomb in deserted or unused bee-hives. The young larvæ when hatched feed on the comb until autumn, by which time they are full-grown. They then spin very tough oval cocoons, which are embedded in the honeycomb, and in that remain without changing to pupæ through the winter, even until the following May or June, when the change takes place. The full-grown larva is nearly an inch long, and rather stout. Body rounded above, rather flattened ventrally. Head narrower than the 2nd segment; it has the lobes rounded, and is, as is also the large frontal plate, slightly polished. Skin soft and rather wrinkled. The ground colour is uniformly a pale dingy brown, appearing darker at the segmental divisions; this appearance caused by the over-lapping of the folds. Head bright sienna-brown; the frontal plate also sienna-brown, but divided in its centre, and also edged in front, with yellowish. Spiracles very minute, dark brown. Ventral surface and prolegs uniformly of a pale yellowish grey; the legs tipped with brown. There are no other noticeable markings. Mr. W. H. B. Fletcher sent me a good supply of these larvæ from the New Forest in the autumn of 1880, from which last year, in July and August, I bred a fine and variable (both as to colour and size) series of imagos.—GEO. T. PORRITT; Highroyd House, Huddersfield, April 4, 1882.

THE PAUCITY OF NEUROPTERISTS.—In his interesting article in the February number of the 'Entomologist' on the "Linnean Order Neuroptera" Mr. King starts with a question as to the paucity of students in this and other orders, which, in a more or less varied form and referring to others of the "neglected orders," has, if I mistake not, been repeatedly asked, but to which I cannot recall having ever seen any attempt at a reply. In venturing to give my own impressions on the subject, perhaps it may be well to premise that my aim in so doing is not by any means to throw cold water on the laudable endeavour being made to enlist more workers in this department of Entomology. On the contrary, I wish to try and help to bring into the light some of the causes of the state of things complained of, with the ulterior view of eliciting any suggestion that can be made towards removing one at least of the contributing causes which appears remediable. Now let us look at the state of things which obtains with the Neuroptera. To go no further afield than Mr. King's paper, we find that the literature bearing on the order is all hidden away in various magazines; that in one group the specimens must be dissected—with the aid of a microscope of course—before the species can be determined; that one or two families cannot be preserved, except in spirits; and so great is the difficulty of naming these, that even an advanced student of the order like Mr. King will not undertake to do so. Some may here be inclined to remark that the difficulties attendant on the pursuit ought to make it all the more attractive; but it must be remembered that we are discussing not things as they should be, but as they are; and I fear that in the vast majority of cases difficulties are not attractive. Minor reasons may possibly be found in the comparatively limited number of species, and in the circumstance that the process of breeding—which affords much interest to many lepidopterists—is not practicable with the Neuroptera. As to collecting this order simultaneously with (say) the Lepidoptera, it has to be borne in mind that the time which most collectors can give to the pursuit is limited, and that not many can go in for several orders with the expectation of making anything like a complete acquaintance with all. I shall not put forward any suggestion of my own as to where any help is to be looked for, beyond saying that it appears to me that a Manual—popular but not unscientific—of British Neucoptera is the first thing needed to increase the number of British Neuropterists. — T. J. Anderson; 24, Florence Place, Glasgow, February, 1882.

REVIEW.

Rhopalocera Malayana: a Description of the Butterflies of the Malay Peninsula. By W. L. Distant. Part I., Royal 4to, 28 pp., 4 coloured plates. London: W. L. Distant, care of West, Newman & Co. Penang: D. Logan, Esq.

When a man, fitted for his work, devotes his best energy in a conscientious manner to any labour, the result should be a masterpiece. Such is the new work of Mr. Distant. Thoughtfully conceived and carefully carried out, Mr. Distant has given us his first instalment of what must become a standard work of reference.

As might be expected, on account of its connection with the mainland of Asia, the insects of the Malay Peninsula belong to many genera which are common to India, and even to the neighbouring parts of the Malay Archipelago, such as Java, Borneo, and Sumatra. This book, then, will be really of necessity to those working the insect fauna of the Indian region generally.

An important feature of the work under notice is the key to the genera, a subject which has been seldom treated, only, we believe, in Doubleday and Hewitson's great work. This latter work is so scarce, expensive, and obsolete, as to make the key given by Mr. Distant of the greatest value.

It is pleasing to find the author is not one of those nomenclators who simply split species, apparently for the pleasure of seeing their own names in brief, after their creations. Mr. Distant has given interesting remarks after finely-divided species, with a view to show that instead of being species such are but local races, &c. The author has been most careful in his acknowledgments of the philosophical literature on the subject, the whole of which he seems to have incorporated in the work: his references are most copious. The chromo-lithographed plates are all that can be desired.

A class work of this kind is a most laborious and expensive undertaking for a private gentleman like Mr. Distant, and is clearly one of those instances where the author should have a small slice of assistance from the fund for the "endowment of scientific research." However, neither trouble nor expense appears to have daunted the author in this case, and we hope he will have the success which he so well deserves.—J. T. C.

OBITUARY.

Henry Moss.—The Lancashire collectors will hear with regret of the death of Henry Moss, which occurred at Oldham, April 17th, after a few weeks' illness, at the age of sixty-four years. He was well known and much respected amongst the older lepidopterists of the neighbourhood, where he will be much missed. —J. T. C.

NOTES ON CURRENT ENTOMOLOGICAL LITERATURE.

Reports of Societies.—The Annual Report of the Entomological Society of the Province of Ontario, Toronto, 1882, is a most satisfactory budget of some 85 pp. and index, printed by order of the Legislative Assembly. This work contains "illustrated reports on the life-history and habits of various insects, prepared by members of the Society for the information of the general public." This being only one of a series of annual reports, the Ontario Society appears to be doing real good, by familiarizing the people with their insect enemies. We are glad to see that in his sketch on "Noxious Insects in England and Canada," the Rev. Mr. Bethune, of Port Hope, gives to our valued correspondent, Miss Ormerod, that credit which is her due, for her 'Manual of Injurious Insects.' The numerous woodcuts in the Ontario Report are fairly executed, but in some instances not printed with that care which would add to the appearance of the book.—In the Report of the Rugby School Natural History Society, 1882, will be found observations on the occurrence of insects, chiefly Lepidoptera. Gratification however, is expressed that the order Coleoptera is receiving attention. Reference is made to the number of desiderata in the Club collection; cannot some of our readers help these gentlemen with a donation of types?

Colonization of Insects.—In the 'Canadian Entomologist' the editor, Mr. William Saunders, mentions (vol. xiv., p. 1) that our European or more strictly English specimens of *Pieris rapæ*, which have settled in Canada, seem to have driven out of the districts colonised, their "American cousins" *Pieris protodice*, which has become quite a scarce insect in some districts. We are not sure that the Canadians are the better for the change, as the former inhabitant of the country was much the prettier insect.

Insect Anatomy.—In the 'Sitzungsberichte der Kaiserlichen Akademie der Wissenchaften' (No. lxxxiii.), Herr von Lendenfeld discusses at length the flight of certain insects, illustrated by seven elaborate coloured and plain plates. This is a very important paper, which deals with the anatomy and physiology of the organs of locomotion of the Libellulidæ. —Mr. V. T. Chambers publishes, under the auspices of the Cincinnati Society of Natural History, an able paper "On the Antennæ and Trophi of Lepidopterous Larvæ." This is one of those carefully-thought-out and written articles which are so conspicuously absent in the Entomological literature of this country. Mr. Chambers states that "the facts and conclusions stated in this paper are the results of observation upon the mouth parts of hundreds of species of *Heterocera* (Macro and Micro), and of a few *Rhopalocera*, and are offered as suggestions to systematists of the Lepidoptera, and may aid somewhat in their classification, especially in that of the *Tineina*," which, says the writer, "is a large group of many families, some of which seem to me to be as far removed from each other in a natural system as they are from any of the *Macro-heterocera*." The author further says, "Mr. Stainton's system . . . . is the best classification of the group with which I am acquainted, . . . and it is with a view to suggesting some amendments to it, not of substituting another for it, that I offer these suggestions." The plates represent a number of mouth parts, which, though somewhat crudely drawn, well illustrate the paper.

J. T. C.

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NATURAL LOCALITIES OF BRITISH COLEOPTERA.

By Rev. W. W. Fowler, M.A., F.L.S.

No. IV.—RIVER-BANKS AND FLOOD-REFUSE.

Collecting by the river-side depends, of course, to a great extent on the nature of the banks. The smaller rivers and streams have their banks down to the edge clothed so thickly with grass and various vegetation that, although they are often very productive, their productions cannot be discovered without the aid of the sweeping-net, and they must rather be treated of under the head of general sweeping. A good many beetles may often be found by pulling aside the weeds and water-plants, and examining the ground at their roots: some species of *Pterostichi*, *Steni*, &c., are very fond of such habitats close to the water's edge. We must, however, leave these smaller streams, and pass on to the larger rivers, such as the Thames, the Severn, the Trent, the Clyde, and others, that afford long-reaches of sand-bank, shingle, and muddy flats, on which beetles of various species are always to be found in favourable weather, sometimes in the greatest profusion. Different species are to be found on the banks of almost every river, but there is a general similarity —as we should expect—as regards the genera, at any rate.

The most characteristic river-bank genus is, perhaps, *Bembidium;* by far the greater majority of this important genus (which contains nearly fifty British species) are to be found on the banks of rivers and ponds. I have found the following species within a very small area on the banks of the Trent and Dove, near Repton:—*Bembidium æneum*, *B. Mannerheimi*, *B. guttula*, *B. biguttatum*, *B. articulatum*, *B. gilvipes*, *B. lampros*, *B. decorum*, *B. monticola*, *B. tibiale*, *B. atrocæruleum*, *B. littorale*, *B. fluviatile*, *B. flammulatum*, and *B. punctulatum*. Some of these species are to be found among the shingle close to the water's edge. Others are to be found running with great swiftness in the sunshine over mud-flats, in company with *Elaphri* and other beetles; of these, perhaps, *B. paludosum*, which looks like an *Elaphrus* in miniature, is the swiftest: it runs, and even takes to wing, more like a *Cicindela* than any other species. A great number, however, of river-bank beetles live habitually in the cracks and crannies in the banks themselves, and the most effective method of procuring a large number of species is by throwing water (by means of the hands or a small vessel carried for the purpose) against the banks: the beetles, imagining that a flood is coming upon them, by a natural instinct rush to the light, and may be captured in numbers. *Bembidium fluviatile*, *Trechus discus*, *T. micros*, and many other beetles that used to be considered rare, may be obtained in this way in fair abundance. The *Anchomeni* prefer the banks of ponds; but *A. marginatus*, *A. fuliginosus*, and *A. micans* are not uncommon on river-banks, and *A. gracilipes* is to be looked for in similar localities. Species also of the following genera among the *Carabidæ* may be met with:—*Clivina*, *Dyschirius*, *Nebria*, *Chlænius*, *Patrobus*, *Taphria*, *Dichirotrichus*, *Tachypus*; and if we include estuaries, we may add many good species of *Dromius*, *Amara*, *Harpalus*, *Stenolophus*, *Pogonus*, and others. River-banks are usually rich in *Staphylinidæ*; some of the best *Homalotæ* are found in such localities, as may be seen from the following list of species:—*H. currax*, *H. cambrica*, *H. eximia*, *H. fragilis*, *H. longula*, *H. delicatula*, *H. subtilissima*, *H. labilis*, *H. carbonaria*, *H. luridipennis*, *H. hygrotopora*, *H. elongatula*, *H. simillima*, *H. pallens*, *H. aquatica*; *Tachyusa umbratica* and *T. constricta* are also to be found; and many species of *Stenus* (*S. biguttatus*, *S. guttula*, *S. lustrator*, *S. pubescens*, &c.), *Oxytelus*, *Homalium*, *Bledius*, and others; last autumn I turned out *Bledius pallipes* by hundreds from the banks of the Severn, near Tewkesbury, by throwing up water against them.

Some of the minuter *Staphylinidæ*, such as *Thinobius*, and some of the very rarest of the *Trichopterygia*, such as *Actidium*, are river-bank insects, and ought carefully to be looked for among shingle or under little heaps of refuse. *Heterocerus*, and *Georyssus* with its curious coating of mud, must not be forgotten, nor must *Cryptohypnus*, among the *Elateridæ*, of which genus one or two species are eagerly sought after by Scotch collectors on river-banks. *Curculionidæ*, too,—for example, *Barynotus*,—may often be turned up under stones near the water's edge, and there are many other species of various genera that often occur: it must, however, be remembered that in windy weather large numbers of beetles are blown into the water, and are carried down until they find their way to the banks, where they remain for some time drying and recovering themselves before starting off afresh.

Before leaving this part of our subject, the river-bank Hemiptera, especially *Salda*, require a passing mention; and the Hydrodromica, *Velia*, *Mesovelia*, *Microvelia*, and *Hydrometra*, though perhaps hardly true bank-insects, cannot well be placed in any other connection.

Beetles can endure immersion in water for a very long period, considering their structure. Nothing surprised the Americans more in the history of the Colorado beetle than the fact that not only rivers proved no obstacle to its progress, but that it even managed to cross Lake Michigan and establish itself firmly on the other side. It is owing to this fact, added to the fact that the hard integuments of beetles are not easily damaged, that makes flood-collecting so profitable.

When a river overflows its banks it seems to sweep all the beetles of the district down with it, and to concentrate them in some few localities: if a river can be watched just as it rises, good species may often be obtained on the spot. Dr. Power once took *Bembidium prasinum* in abundance in this way. When once it has overflowed its banks, the direction of the wind should be noted, and a good collection of refuse and *débris* be gathered from under the railings, hedges, or banks against which it has been drifted. The observation of the wind is important, as anyone who knows the ground will by it be enabled at once to tell where he will find an accumulation. No one who has not tried flood-collecting can have any idea of the enormous quantities of beetles that one bag of rubbish will produce; of course a large majority are very common species, but it is very seldom that a flood does not produce some good ones. I have been very successful in large floods of the Trent, at Repton; in fact, the chief part of my collection as a beginner was made up of beetles taken from these floods: *Philhydridæ*, *Staphylinidæ*, and small *Carabidæ* are most frequent, but beetles of all families may be found. On one occasion at Repton I took *Euplectus minutissimus*, Aubé, in numbers: this beetle is very rare on the Continent, and has never been taken before or since in Britain; but I have no hesitation in saying that it must have been brought down by the flood on that occasion in thousands, to judge from the amount that we found in our bags. I mention this beetle, as showing how likely it is for anyone to find new beetles by this method of collecting; for a flood empties out many localities where a collector would not think of searching, or which perhaps he could not get at.

The refuse should be collected while the flood is still rising, or just as it has reached its height: it is astonishing how soon the beetles make their escape when once it has ebbed and left the rubbish behind; stray specimens of course are left, but these are, as a rule, not worth the carrying home. The most successful flood-collectors of late years have been Messrs. Wilkinson and Lawson, of Scarborough: they generally used to get their refuse from the small mountains and moor-streams, and their takes were astonishing. Most coleopterists will remember Mr. Lawson's capture of some three hundred examples of *Anisotomidæ* and allied groups, comprising representatives of *Hydnobius punctatissimus*, *H. punctatus*, and *H. strigosus*; *Anisotoma rugosa*, *A. dubia*, *A. ovalis*, *A. scita*, *A. lunicollis*, *A. calcarata*, *A. litura*, *A. badia*, and *A. parvula*; and also of *Cyrtusa minuta*, *Liodes orbicularis*, and *Amphycillis globus*.

If anything else were needed to prove that the rejectamenta of small streams, and even of ditches, should never be neglected, we might mention Mr. J. J. Walker's take of *Bagous inceratus*, *B. frit*, and *B. subcarinatus*, from rubbish collected from the sides of a ditch, and Mr. Champion's capture of *Bryoporus* and *Hydroporus celatus* from refuse of Scotch mountain-streams.

In examining the flood-refuse at home the windows should be kept shut, as many species will fly to them and so be easily captured: the examination should be made very carefully, and not hurried over, as the best species often turn up just as one thinks that nothing is left, and is about to throw the rubbish away: the reason of this is that many species curl up their limbs and body, and take a very long time before they stir; and many, too, hide away in the hollow bits of stick and reed that form a very large portion of all flood-refuse. Messrs. Wilkinson and Lawson, I have heard, used to place their rubbish in a sieve, with a bag underneath, and then put a little ammonia amongst it: the beetles immediately rushed away to escape from the fumes, fell into the bag, and so were easily eliminated and captured; I have never tried this plan, but it seems feasible, unless the ammonia should kill the smaller and more delicate species before they could escape. A basin with steep sides is the best vessel in which to examine flood-refuse. If a shallow vessel, such as a dish, is used, a great number of beetles will escape. The rubbish may be kept for a long time, and yet be productive. It is always as full of larvæ as of beetles, and these will breed out and fresh species keep appearing.

Lepidopterists will find flood-collecting by no means unprofitable; for although of course the perfect insect cannot be found, at any rate in any sort of good condition, yet good larvæ may often be discovered not much the worse for their immersion, if it has not been a long one.

The School House, Lincoln, May, 1882.

NOTES FROM GRANGE AND WITHERSLACK.

By Edmund Shuttleworth.

On May 13th, as the weather was promising, I started from Preston by the 8 a.m. train for Grange, where I arrived at about 10 o'clock, when I proceeded to the woods with the intention of doing a little collecting.

The first insect I saw was a *Lycæna Argiolus*, followed shortly afterwards by a second; I saw plenty of them in the course of the morning, but, as their favourite flight is over and around the tops of the highest hollies, they are by no means easy to catch. Upon searching the trunks of sundry old and lichen-covered beech trees I boxed about a dozen specimens of *Nepticula tityrella*, which were sheltering in crevices of the bark on the lee side of the trees; I also kicked up and captured, from among some dwarf hollies growing round the base of the trees, several fine examples of *Nemophora Swammerdamella* and *N. Schwarziella*

Flitting about, in the partial shade afforded by beech and fir trees, were a few *Micropteryx Thunbergella*, affording no clue, however, to the habits of the unknown larvæ; those I took were in fine condition, evidently only just out.

Upon leaving the wood I had to clamber over a loose shingle-wall, at the imminent risk of personal injury. I got over safely, however, and found myself, for the first time this season, face to face with *Nemeobius Lucina*, which, with *Thanaos Tages*, was flying about in the sunshine; a series was soon completed, when I turned my attention to *Ennychia octomaculalis*, but this lively gentleman defied my utmost efforts,—when the sun is really hot this insect *does* fly. Amongst the golden-rod I was fortunate enough to obtain about a dozen fine *Catoptria aspidiscana*, but it was roughish work, as the plant grows on a very slippery limestone formation, evidently the remains of an old glacier, which is traversed in all directions with deep and narrow holes, partially hidden with verdure; and the sensation of having one leg suddenly and by no means gently disappear, while the other one remains stuck out in front, to say nothing of the temporary inconvenience caused by the shock, is not the pleasantest situation in the world. *Eupœcilia ruficiliana* was common among cowslips.

About 12.30 I came upon my friend Mr. Threlfall, and as he was going on to Witherslack I packed up my bag and joined him. Upon our arrival at the "Derby Arms," our head-quarters, we put ourselves in light marching order, and under a blazing sun started off for a row of birch trees growing on the moor about two miles away. We were lucky enough to obtain a few examples of the rare *Nepticula lapponica*, which, I believe, has only been taken in one other locality in England, viz. Scarborough, by the late Mr. Wilkinson. At every step amongst the heather such insects as *Phoxopteryx uncana* and *P. unguicana*, *Clepsis rusticana*, *Gelechia ericetella*, *Elachista Kilmanella* (in swarms), and *Micropteryx Allionella*, started up, and after a short flight of a few yards settled again. Here I made my first acquaintance with *Thecla rubi*, alive and on the wing; and a few minutes afterwards—a lucky back-hander with the net—terminated the somewhat hasty flight of a fine male *Saturnia carpini*. The local little *Primula farinosa*, one of the prettiest of our English flowers, was scattered about in some profusion. When the sun went down a cold breeze sprang up, which prevented any further captures for that day, except that of a pair of *Larentia salicata*, one of which I caught whilst taking a flying jump over a hedge.

We were up again the next morning at 6 o'clock, setting our captures of the day before; this did not detain my friend very long, but kept me without a stop, with the exception of breakfast, hard at work until 12.30, when Mr. Threlfall returned disgusted, having only found six larvæ of *Spilonota lariciana*, where he expected to obtain a quantity. As we dined at 2 o'clock we thought we could not fill up the time better, until that desirable meal was ready, than by collecting the larvæ of *Dicrorampha consortana*, which we accordingly did. For the benefit of those who are unacquainted with the habits of this larva, it draws together the flower-head and leaves of the ox-eye daisy, twisting it up with a most unmistakable care, and feeds concealed therein.

In the afternoon, a strong north-east wind having arisen, we were driven to the only sheltered spot about, viz., at the back of a short range of rocks, where, amongst the heather and golden-rod, we completed a series each of *Catoptria aspidiscana* and *Phoxopteryx unguicana;* besides which, among sorrel (*Rumex acetosella*), *Gelechia velocella* occurred sparingly.

We tried again in the evening for *Larentia salicata*, but the wretchedly cold wind drove us into our inn, where we consoled ourselves with talk of what we might have caught if the weather had been more propitious.

8, Winckley Square, Preston, May 17, 1882.

EFFECTS OF WARMTH AND SURROUNDING ATMOSPHERIC CONDITIONS ON SILKWORM LARVÆ.

By E. A. Ormerod, F.M.S.

The very useful note of your correspondent, Mr. Dobson, regarding effect of heat on *Notodonta dictæa* (Entom. xv. p. 65), suggests that a few observations I made in West Gloucestershire about ten years ago, on effects of temperature and of atmospheric conditions on rate of development of common silkworm larvæ, may be of some little interest; though, at the same time, I rather hesitate to offer them, as, with regard to such a well-observed larva, it may be that every point has already been noted.

The larvæ were received on the 8th of June, and were then about from half to three-quarters of an inch in length; and were divided for experiment into three parties, of which one was placed in a succession vinery of which the air was very damp (the grapes being then at the stage in which the house required frequent syringing); and the temperature was always genial, but variable, as it was raised by sun-heat, but not artificially, excepting occasionally by warm air admitted from the next house. Another party of larvæ was placed in a room of which the window was closed at night, where the temperature was about 60° to 64°; and the remainder in a large garden-loft where the windows and door were open day and night, and the larvæ were consequently exposed to draughts of air and a much lower temperature, the lowest noted being 48°. The rate of growth of the "worms" varied according to the warmth of the air and its general suitableness for their health. On the 17th of June—that is, nine days after they were received—those in the warm and damp vinery were grown, in the most advanced instance, to 2⅜ in.; those in the room to 1¾ in., and those in the draughty loft to about 1⅜ in.; all the larvæ having been treated alike in matters of food. On June 21st the vinery larvæ were 3 in. long, those in the house about 2¼ in., and those in the loft 1⅞ in. By June 23rd numbers of the vinery caterpillars were spinning; of those in the house two began to spin on June 26th, but the mass did not spin for some days later; the caterpillars in the draughty loft did not begin to spin until July 6th.

The worms varied in condition as well as rate of growth, those in the vinery being plump, soft, and warm to the touch, and appearing as if in active brisk enjoyment of their lives; those in the house were firmer and harder; and the loft caterpillars had a cold, dead feel; they all, however, appeared healthy, and I had very few losses—which I conjectured was from the method of feeding; but not understanding silkworm management I cannot say with certainty.

The worms were fed by placing good-sized sprays (about a foot or a foot and a half long), just cut from the mulberry-tree, upright in large pots or boxes (or any convenient receptacle) of earth. The creatures fed eagerly on the leaves, and not having to move about on a defiled surface were thus kept perfectly free from contact with anything that might soil their skins; they had fresh food and fresh air around them, and having constant natural exercise hardly ever required handling, for they were willing to transfer themselves to their new food-shoots.

When I had leisure, I scraped the surface-earth off and threw it away—if I had not time, I dressed it over, and my caterpillars throve; and those in the vinery spun remarkably well. Possibly this matter is so well understood by silkworm rearers that the subject may not have the interest it had then to myself; but to those who wish to rear a few "worms," and have the convenience of a mulberry-tree at hand, I can recommend the plan of feeding as affording a very pretty sight, without the drawbacks of various kinds (and to various senses) attending feeding in trays; and where—as is sometimes the case—a number of caterpillars spin on a single bough, the branch of golden silken cocoons forms a beautiful object for the cabinet or any other purpose.

Dunster Lodge, near Isleworth, March 4, 1882.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Colias Edusa and Sphinx convolvuli.—One or two specimens of *Colias Edusa* were captured by me in a clover-field last season; and a fine example of *Sphinx convolvuli*, in the park of D. Henty, Esq., settled on a wooden rail enclosing some fir trees. —Joseph Anderson, jun.; Chichester, April 26, 1882.

Argynnis Adippe *var.* Cleodoxa.—Last March I was fortunate enough to become the possessor of an English *Cleodoxa*, which it may be well to place on record. Mr. T. W. King was kindly allowing me to select from his duplicates any I wanted. Amongst others he gave me what he described as a good variety of *Argynnis Adippe*, and this, on comparison with the figures in Newman's 'British Butterflies,' I at once saw was undoubtedly *Cleodoxa*. The specimen was caught at Sevenoaks, Kent, between 1854 and 1856, and re-set with an entomological pin.—P. Bright; Arnewood, Bournemouth, May 19, 1882.

On the Females of Lycæna Adonis and L. Corydon.—One of the puzzles of Entomology has undoubtedly been how to distinguish accurately from each other the females of these two species. I speak with diffidence, as I possess only three females of *Lycæna Adonis*; but it appears to me that in *L. Adonis* the white of the fringe is much more sharply separated from the black than in *Lycæna Corydon*, and that in the latter the white is decidedly tinged with ochreous, while in *L. Adonis* it is pure white. The dark colour of the fringe, too, is much more decided in *L. Adonis* than in *L. Corydon*, in which it is more of a brown shade. I hope other entomologists of greater experience may be induced to look into this question, and to give the public the results of their observations.—(Rev.) CHAS. F. THORNEWILL; The Soho, Burton-on-Trent, March 3, 1882.

LYCÆNA ARGIOLUS.—On p. 103, vol. vi., of the 'Entomologist,' I recorded the capture of this insect on April 3rd, 1871. I can now give a still earlier date, a friend of mine having captured a specimen on a rosemary bush at Temple Combe, Somerset, on March 24th, 1882.—W. MACMILLAN; Castle Cary, Somerset, April, 1882.

VARIETY OF POLYOMMATUS PHLÆAS.—A variety of *Polyommatus Phlæas* was taken by myself at the end of last July, whilst collecting at Polegate, near Eastbourne. I saw it first on the wing (it appeared unusually dark) as I was working a spot pointed out to me by your correspondent Miss R. M. Sotheby. The variety consists in confluence of spots, which has resulted in a rather distinct crescent-shaped mark on each fore wing.—HAROLD HODGE; Pembroke College, Oxford, Dec. 12, 1881.

VARIETY OF SMERINTHUS TILIÆ.—A fine variety of this species, bred by myself from larvæ found last autumn, emerged from pupa April 23rd last. The colouring is very curious, there being an entire absence of any green. All the markings, which are usually green, are light burnt sienna-red; the usual whitish blotch at the tip of the fore wing is pink; ground colour also pink, in places slightly tinged with grey; under side composed of various shades of light sienna-red and pink; thorax and abdomen also of the same colours.—FRED. W. FROHAWK; Upper Norwood, April, 1882.

EARLY PUPATION OF CHELONIA CAJA.—A mild winter and sunny March invariably produce newspaper reports of early butterflies and spring flowers; but the following fact is more curious than usual. On March 13th, whilst searching a bank with south-west aspect for cases of *Coleophora albitarsella*, I picked up a larva of *Chelonia caja*, which after being in a warm room three days spun up, and changed to pupa on the 20th. When found it did not exceed one inch in length, and was without the long hairs so characteristic of the species when more than half-grown. The pupa, which is rather smaller than that of *Callimorpha dominula*, is suspended in an unusually thin web.—Sydney Webb; 3, Luther Terrace, Dover, March 27, 1882.

Retarded Development of Saturnia carpini.— In the year 1879 I reared a batch of *Saturnia carpini* from eggs. Most of these emerged in due course the following spring (1880). Five took another year to complete their metamorphosis; no unusual occurrence with this species. Expecting no more imagines from my cocoons I deposited them all in a box, and placed them on a shelf in my little room for odds and ends of this sort. On April 28th of the present year I heard a noise proceeding from this box, and on opening found two perfectly developed males. On the following day a female appeared. I was surprised at the lack of gallantry manifested towards her by the former; they ignored her existence. Wanting eggs I exposed her on the heath, thinking that a younger and more ardent generation of males would not be so indifferent to the mature charms of my interesting female; but to my disappointment no free-born male would be induced to bestow any of those delicate attentions which the males are usually so eager to lavish on the fair sex; and after six days of marked neglect she died, without having an opportunity of fulfilling any of the functions of her existence. Is it possible that she had reached a period of life in some way analogous to the aged among the higher animals? It is a well-known fact that some isolated specimens among the *Bombycidæ* pass several years in the pupa state, the delay being attributed to some unfavourable atmospheric condition occurring just at the time of emergence. This does not appear to me a satisfactory explanation of the phenomenon of retarded, or rather suspended, development. Heat naturally existing or artificially applied accelerates emergence up to a certain point, after which it is not only powerless, but actually destructive to life. It is scarcely credible that individuals in a batch of larvæ exposed to precisely the same temperature, and similarly treated in every respect, should have their development arrested for some three or more years beyond the rest on any heat theory. Is it not more reasonable to connect the retarded emergence of certain specimens rather with some internal or organic peculiarity of the individuals than surrounding influences?—W. M'Rae; Westbourne House, Bournemouth, May 19, 1882.

Angerona prunaria.—I am breeding *Angerona prunaria*. The first moth appeared on May 9th, which I think is an exceptionally early date.—Thomas Huckett; 200, New North Road, Islington, May 22.

Occurrence of Tephrosia consortaria in London.—I took a fine male specimen of *Tephrosia consortaria* in Bedford Square, Bloomsbury, on May 20th. It was at rest on one of the large sycamore trees, of which there are several fine examples in the Square.—Id.

Stauropus fagi and Notodonta trepida.—Last Saturday I took a fine male *Stauropus fagi* from a beech tree at Black Park; and I have recently bred *Notodonta trepida* from a larva beaten at Abbott's Wood last August.—L. F. Hill; 4, Craven Terrace, Ealing, W., May 14, 1882.

Stauropus fagi.—My *Stauropus fagi* larva, which I mentioned last month as having been found and fed upon apple last autumn, produced, I am pleased to say, a fine male on 24th inst. —Joseph Anderson, jun.; Chichester, April 26, 1882.

Notodonta trepida.—I have had the pleasure of rearing a fine series of *Notodonta trepida*, from larvæ taken last season in Epping Forest.—D. Pratt; 398, Mile End Road, London, E., May 15, 1882.

Acronycta alni in Norfolk.—In July last I found here a larva which answered exactly to the description of *Acronycta alni*. I observed it had a peculiar smell about it, and in the cage it assumed the characteristic bent form of *A. alni*.—R. A. Slipper; The Vicarage, Tuttington, April 6, 1882.

Acronycta alni.—On July 24th, 1881, I started with the hope of a good day's collecting to Sevenoaks; but as soon as I reached my collecting ground there came on a storm of rain, which lasted quite an hour. When the sun came out and had nearly dried the trees, a second storm came, which caused me to consider when the next train would convey me back to London; but the sun shone out again, and I decided to have a look for the larva of *Acronycta alni*. As beating was out of the question, I had been searching the leaves for about half an hour, when I was rewarded with one from birch, and soon afterwards I found one upon oak, which was unfortunately ichneumoned. The first one fed well, and changed to pupa on August 12th, when I accommodated it with a piece of rotten wood, which it entered, leaving no trace of its entrance; and I have now the pleasure to record its appearance as a splendid specimen on May 11th.—D. PRATT; 398, Mile End Road, London, E., May 15, 1882.

CATOCALA NUPTA FEEDING ON PLUM.—On March 25th several larvæ of *Catocala nupta* emerged from eggs in my possession. I at once offered young and tender sprigs of willow, which, as I believe, is the favourite food of these larvæ, but they refused to touch it; as also sallow and a variety of other plants, even lettuce, which I have never known to be refused by other larvæ. I reared a large brood of *Arctia fuliginosa* on lettuce last year. Finally the *Catocala* larvæ chose some leaves of plum, and have continued to feed on these leaves, steadily refusing all other food. As I have never heard, or read, of larvæ of *C. nupta* feeding on plum, I thought it might be useful to others to know these larvæ may be reared on the leaves of that tree.—WILLIAM FINCH, jun.; Arkwright Street, Nottingham, April 4, 1882.

DESCRIPTION OF THE LARVA OF SCOPARIA MURALIS.—During March and April, and even well into May, the larvæ of this species may be collected in abundance by stripping off the moss on old walls in this district. They are found living in silken galleries under the moss, a piece of moss and turf two or three inches long often containing quite a cluster of them. Length about half an inch to a little over, and of average bulk. Head the same width, or perhaps very slightly narrower than the 2nd segment; it has the lobes rounded, and is—as are also the frontal and anal plates—very highly polished. Body cylindrical and of nearly uniform width, tapering only a very little at the extremities. Segmental divisions well-defined, and these, together with the large raised tubercles, give the body a rather wrinkled appearance. Ground colour dingy ochreous-brown, or in some specimens purplish brown, the head and plates intensely black. A fine brown line, widening at the segmental divisions, extends through the centre of the dorsal area; a wavy brown stripe along the subdorsal, and another one along the spiracular region; all these lines together giving a reticulated appearance on the paler ground colour. The tubercles are very dark brown, and are polished, but not so highly as the head and plates. Spiracles black. Ventral surface of the colour of the dorsal area. Having ceased feeding, the larva forms and lines with silk a cavity in the soil at the roots of the moss, in which it changes to a pupa. This is nearly half an inch long, and of ordinary shape and proportions; it is highly polished, and has the abdominal divisions, the eye-, leg-, and wing-cases clearly defined, though not prominent. Colour bright brown, the front of the thorax with an olive tinge; eye-cases darker than the ground colour, and the abdominal divisions chocolate-brown: these dark abdominal divisions, too, show clearly, even through the lower part of the wing-cases. The imagos emerge in June; and from a June moth I one season reared a second brood in August.—Geo. T. Porritt; Highroyd House, Huddersfield, May 9, 1882.

Captures near Leafwood, Sussex.—I have diligently worked this district this spring, and have taken thirty-one varieties of Macro-Lepidoptera, including the following:—*Cymatophora flavicornis*, *Trachea piniperda*, *Tæniocampa rubricosa*, *T. gracilis*, *T. munda*, *Xylina rhizolitha*, *X. petrificata*, *Amphydasis prodromaria* (a long series), *Hemerophila abruptaria*, *Lobophora lobulata*, and *Cidaria psittacata*.—G. R. Ware; Leafwood, Frant, Sussex, March 23, 1882.

Notes on Insects at Sugar.—Subjoined are a few notes on my sugaring experience during the last season. They may be of interest, as showing the effect of prevailing weather on the abundance or otherwise of insects, though I am sorry to say none of the captures mentioned are individually worth noting. May 26.—Close, sultry night, with a breath of wind from the east, and sheet-lightning playing about the horizon. Blank evening; nothing appearing but a solitary *Noctua xanthographa* and three *Gonoptera libatrix*. On a cold, clear night early in June; wind light from S.W., and moon (nearly at the full) shining brightly on the trees, I had a fair attendance of common Noctuæ, as *Grammesia trilinea*, *Agrotis exclamationis*, *A. segetum*, *Noctua plecta*, *Triphæna pronuba*, &c.; I also took *Hadena adusta*. June 21.—Mild night, wind S.W.; Noctuæ scarce, but several

Geometers appeared in plenty. *Cabera pusaria* and *Melanippe montanaria* swarmed at the trees, and were a pest; also *Boarmia rhomboidaria.* I took, too, *Melanippe albicillata* and *Phorodesma dolobraria.* July 1st was an exceedingly hot day; clear night, wind N.E., but very light. Moths very abundant: *Leucania pallens, Xylophasia lithoxylea, X. hepatica, Miania strigilis, G. trilinea, Caradrina blanda, Rusina tenebrosa, A. segetum, A. exclamationis, T. pronuba, N. plecta, N. C-nigrum, N. triangulum, N. brunnea, N. festiva, Euplexia lucipara, Aplecta herbida, A. nebulosa, Hadena dentina, Mania typica,* and one specimen of *Cymatophora ocularis.* The Geometers were best represented (in point of numbers) by *B. rhomboidaria.* I cannot help remarking here—as many others have done lately—on the extraordinary abundance everywhere of *Triphæna pronuba* last season. Many pretty varieties have turned up. In particular, I have taken one with upper wings very pale, and suffused with a faint olive-green tinge; the discoidal spots in contrast dark and clearly defined. July 5th was another scorching day; the evening was clear, with moon shining; wind N.E.; later on it became cloudy, and the wind veered to S. and W. Insects as abundant as on the 1st. I took the same species again, with the addition of *Thyatira derasa* and *T. batis.* July 18th proved a bad night, though the weather promised fairly enough. Nothing came but a few *M. typica* and such-like invaluable species. July 20 and 21.—Weather cool, with N.W. breeze. Both blank nights. Some half-dozen in all of *T. derasa, Apamea oculea,* and *Leucania lithargyria.* July 29.—Wind S.W., sky clear. Another blank night; *Amphipyra pyramidæa* only. August 9.—Weather very unsettled, chilly, with heavy showers at intervals. *A. pyramidæa* abundant; *A. tragopogonis;* took also *Larentia pectinitaria* and *Cidaria silaceata.*—C. Candler; Harleston, Norfolk, 1882.

Notes on Lepidoptera.—I have to record the capture of two *Bryophila glandifera* on a fence at Portsmouth last July. Being the first time I have heard of its occurrence there, I thought perhaps it might be a new locality for it, and worth noting. I have also to record the capture by myself, on a fence at Roehampton, of a very light variety of *Acronycta psi,* having the fringes of the fore wings, and also the tip of the abdomen, of a beautiful rosy pink colour. I have a *Chelonia caja,* female, bred last season, with the veins all marked with the dark ground colour and carried across all the white spaces; but unfortunately not being at home at the time, it had been flying about and wore away the edges of the wings, or else it would have been a very fine variety. I have bred among my *Arctia menthastri* one specimen having the ground colour of a distinct yellowish cream-colour, exactly the same tint as the blotches in *C. villica*, and another specimen almost as spotless as *A. urticæ*.—H. Sharp; 37, Union Street, Portland Place, London.

Lepidoptera near York.—In the beginning of last August I had the good fortune to receive from a friend a nearly full-fed larva of *Acronycta alni*. It was found feeding on a low crab-tree, and fed for a few days longer. I had supplied it with a piece of decayed wood, which it readily made use of for the purpose of cocooning in. I anxiously await its appearance during the coming season. I am glad to record the capture of *Laverna ochraceella* in this locality. I found one specimen in 1880, and two in 1881, amongst *Epilobium hirsutum*, in the evening, seated on the leaves. —T. Wilson; Holgate, York, April, 1882.

Lepidoptera near Northampton.—Two specimens of *Sphinx convolvuli* were taken by a local collector in a garden on the same evening, while two more were obtained about the same time—the first week in September last—but in a different neighbourhood. Among the Rhopalocera, *Apatura Iris*, *Nemeobius Lucina*, and *Thanaos Tages* deserve notice. Other species, obtained chiefly by entomological members of our Natural History Society, were *Macroglossa fuciformis* and *Sesia apiformis*; whilst *Bombyx quercus*, strange to say, is hardly ever obtained in this neighbourhood, though it can be obtained in plenty in one direction, about nine miles off. *Notodonta chaonia* is rare, as also is *N. dictæa*. A single specimen of *Acronycta alni* was obtained. Other species are *Acronycta auricoma*, *Leucania impura*, *Hydræcia nictitans*, *Mamestra abjecta*, *Noctua umbrosa*, *Orthosia macilenta*, *Cirrhædia xerampelina*, *Dicyla oo*, *Aplecta herbida*, *A. occulta*, and *A. advena*; also a single specimen of *Plusia iota*. *Ennomos tiliaria* was rather plentiful. *Phorodesma bajularia*, and a poor specimen last December of *Larentia multistrigaria*; *Chesias spartiata*, *Scotosia vetulata*, *Argyresthia Brochella*, *Crambus cerusellus*, and a fine specimen of *Galleria millonella*; other good insects have also been taken. One specimen of *Heliophobus hispida* was taken some time ago at Whittlebury Forest, where also was taken *Leucania littoralis.* Ivy-bloom, although having been searched diligently for several seasons, has proved as yet a thorough failure, hardly an insect being obtained last season, the other years being little better. I obtained on February 11th of this season an interesting aberration of *Phigalia pilosaria*, resting on the trunk of a willow.—HERBERT F. TOMALIN; 24, York Parade, Northampton, April 26, 1882.

NOTES ON THE SEASON.—One would have thought that, after the past very exceptionally mild weather, Lepidoptera would have generally been abnormally early, if not abundant. My experience of the last few weeks does not favour either exception. In a recent visit, amongst other localities, to Barnwell Wold and Monks Wood, Huntingdonshire, I have found Lepidoptera decidedly scarce, both in species and numbers. The larva of *Thecla pruni* was taken with really hard beating in the former locality, but we could not find it at Monks Wood. *Hesperia paniscus* appears to have quite died out of both those localities, where it used to occur commonly. We could not hear of its capture in that neighbourhood for several years past. Larvæ, especially the common spring species, appeared plentiful enough, so we must hope for better things as the season advances.—JOHN T. CARRINGTON; Royal Aquarium, Westminster, May, 1882.

LEPIDOPTERA OF THE SALT-MARSHES.—During a recent expedition to the salt-marshes, at the mouth of the river Thames, I found the larvæ of the local plume-moth, *Agdistes Bennetii*, at rest in the daytime upon the leaf-stalks of sea lavender (*Statice limonium*). Finding these larvæ in the daylight is about as trying a matter for one's patience as I know, for they get close down towards the roots of the plant, and are just the colour of the leaf-stalk. At night they would probably be much easier to obtain. I have had the pleasure of sending three specimens to Mr. South, who had, I understand, obtained drawings of the larvæ previously, and has now got those of the pupæ, for his plates of the plumes, and so completed the life-history of that species. I also found at the same time a couple of broods of larvæ of *Bombyx castrensis*, but far away from any *Artemesia maritima*, which is said to be the food of this species.—E. G. MEEK; 56, Brompton Road, London, S.W., May, 1882.

Atomaria linearis a Mangold Enemy.—I send you a brief note of an insect enemy, new to this district, which has attacked the mangold plants which early in the spring were planted for seed. The plants had come up and were growing well, when the young leaves were observed to die off, and become brown and withered. On examination it was found that each withered bunch of leaves contained a number of small beetles. The specimens Mr. E. A. Fitch has kindly sent to Dr. Power, who has confirmed his identification of the species as *Atomaria linearis*, Steph., and he also says in his letter to me:—"Curtis notices it as a mangold enemy in 'Farm Insects,' p. 395. It does not content itself at a later period with attacking the root, but when it is fine weather it comes out of the ground, ascends the stem, and devours the leaves. These little creatures often appear in families on a small plant, of which in a few hours nothing remains but a leafless stalk, which presently withers and dies. M. Bazin first observed this insect in 1839 at Mesnil-St.-Firmin, and some years later M. Macquard stated that it devoured the fields of red beet in the neighbourhood of Lille to such an extent that the cultivators were obliged to replough and resow the fields" (Ann. Soc. Ent. France, 1847). It is difficult to say what is the cause of the sudden appearance, in any particular district, of a destructive insect. In this instance, although mangold-seed has been grown on this farm for upwards of twenty-five years, this little beetle has not been observed to attack the plant until this year. It may, however, have been introduced with the seed, which was from another district; but until the life-history of the species be known it is not possible to say if this could be so or not.—Herbert Fortescue Fryer; The Grove, Chatteris, May 8, 1882.

Gall-making Trypetidæ.—I have lately identified two more British gall-making *Trypetidæ*, by the help of H. Loew's fine work, 'Die Europäischen Bohrfliegen.' The species referred to by Mr. Moncreaff as "reared on September 14th, from galls in the receptacle of *Inula crithmoides*; the receptacle becomes thickened and enlarged, and has a hard woody texture; about seven cells in one flower-head; the larva forms a cocoon" (Entom. v. 450), was named by Mr. Walker "*Tephritis signata*, Meig.," but is, as I suspected, *Myopites inulæ*, v. Roser (*op. cit.*, p. 65, pl. vi., figs. 3, 4). Walker received eight specimens from

Mr. Moncreaff, which are now in the British Museum. Loew says *M. inulæ* is not rare on *Inula* and *Pulicaria* in Central Europe. Schiner bred his *M. Frauenfeldi* from *Inula crithmoides*, but ours is not that species (Fauna Austriaca, Die Fliegen, ii. 142). Also in the National Collection are four specimens of *Urophora macrura*, Loew (*op. cit.*, p. 69; pl. xi., fig. 1), labelled in F. Smith's handwriting, "Bred from galls in the flowers of the common groundsel." Mr. Smith showed me these specimens himself a few years ago, and asked me if I had bred the species; but I quite fail to remember the locality whence they came, if he told me. I am sure, however, they are British. Whether the specimens bred by Frauenfeld from the swollen flower-heads of *Onopordon illyricum* and *Centaurea calcitrapa* are *U. macrura* requires confirmation. Loew says this species is only certainly known from Greece. — Edward A. Fitch; Maldon, Essex, March, 1882.

ICHNEUMON ERYTHRÆUS.—In the April number of the 'Entomologist' (Entom. xv. 92) Mr. Billups noted the peculiar propensity of an *Ichneumon* for selecting ant-hills to hybernate in. The insect is *I. sanguinator*, Rossi, not *I. erythræus*, Gr., as there stated. I am responsible for the mistake. Mr. Billups, I think the year before last, sent me an *Ichneumon* to name, and which I believed was a variety of *erythræus;* last year he took another, which he very kindly gave me: and so matters stood, till Mr. Billups made the above discovery this year. I am indebted to my friend Mr. Fitch for the suggestion that Mr. Billups' insects might be *Ichneumon sanguinator*, Rossi, and distinct from *I. erythræus:* a series of the former Mr. Fitch had seen in the British Museum collection,—seven from Desvignes' collection, two from Heysham's, and one from Dr. Power's. Mr. Billups sent me six more of this beautiful little insect, which I found did not vary at all; none had the yellow marks of *erythræus;* and, on referring to the various authors, I believe there is no doubt but that *I. ruficollis,* Stephens, which certainly is Mr. Billups' insect, is the same species which Wesmael described in his 'Tentamen' (p. 102) as *I. discrepator*. I am the more strongly convinced of this because Dr. Capron last week sent me a male *Ichneumon* for my opinion, and which without doubt is the male of *I. discrepator*, Wesm.; and in his letter he said, "Headly Lane is not far from here" (Shere). These two descriptions agree very well with the description of *I. sanguinator*, Rossi, in Gravenhorst's I. E. iii. 918; but as the description is short there must be some doubt about it. *Ichneumon sanguinatorius*, Gr., I. E. i. 295, synonym of *Amblyteles occisorius*, is quite a different species. Probably, on account of the slightly exserted ovipositor, Marshall placed *I. sanguinator* in the genus *Phygadeuon* with *Cryptus sanguinator*, Desvignes, as a synonym, which must be a mistake. Desvignes, in the British Museum Catalogue, gives both *Ichneumon sanguinator* (p. 29) and *Cryptus sanguinator* (p. 58). From the above it is evident that *sanguinator*, Rossi, must be added to Marshall's list. Its place in our table will be (vol. xiii. 216) section 12, B. a.:—

* Thorax and scutellum yellow-marked. - *erythræus*, male and female.
** „ „ not so marked. - - *sanguinator*, female.

The male comes in section 6 (vol. xiii. 181),—A. Abdomen, 2nd to 4th segments red; and after "a.":—

† Antennæ and hind tarsi white-ringed. - *sanguinator*, male, 4½ lines.
†† „ „ not white-ringed.

In structure it might be placed in Holmgren's division 8, if in any of his divisions; it differs from all, but comes nearest to this. It might go into B. of section 7, but for the aciculate 1st segment; this latter mark wants adding to the description of section 8 to make it exact.—J. B. Bridgman; 69, St. Giles' Street, Norwich.

Thryptocera bicolor.—At the end of May or beginning of June last, I had fifty larvæ emerge from a full-fed caterpillar of *Bombyx quercus*. On the 1st May the first imago made its appearance, which proved to be a specimen of this very rare dipteron. Dr. Meade very kindly identified it. Mr. Walker, in his 'Insecta Britannica,' mentions that there was one specimen in Mr. Stephens's collection. Herr Schiner, in the 'Fauna Austriaca,' says he had one specimen which was bred from *Bombyx quercus*, and adds that it has also been bred from *P. mediella*. Dr. Meade, in his letter to me, states that he has one, a German specimen, and that those I sent him are the first British ones he has seen. The larva of *Bombyx quercus* was taken at Falmouth.—G. C. Bignell; Stonehouse, May 5, 1882.

Note on Parasitic Diptera.—It seems that occasionally flies which are not usually parasitic in their habits become so under particular circumstances, or in certain localities. The causes of this peculiarity are very obscure, and the fact is very interesting; so that any well-authenticated instance is worth recording. In

March last, Professor C. V. Riley (State Entomologist), of Washington, U. S., sent me some *Muscidæ* which he said were enemies (parasites) of the cotton-worm (*Aletia argillacea*, Hübner). I found that they were specimens of the common *Cyrtoneura stabulans*, Fallen, a fly which is generally distributed over Europe and North America, and has also been found in New Zealand, according to Schiner. The larvæ of this Muscid are said to live generally on fungi, but probably also eat all kinds of decaying vegetable matter, and also manure; for, as their name imports, they often abound in stable-yards. In the 'Fauna Austriaca,' Schiner adds that, according to Hartig and Bremi, they also prey upon the larvæ of butterflies and bees.—R. H. Meade; Bradford, May 15, 1882.

Appointment of Consulting Entomologist.—We have great pleasure in announcing that the Royal Agricultural Society of Great Britain has appointed our valued correspondent, Miss Eleanor Ormerod, to be consulting entomologist to that Society. The committee of the Royal Agricultural Society is to be congratulated upon its selection; as is also Miss Ormerod upon her further opportunity for the development of the generally neglected study of Economic Entomology. We understand that, at the express desire of Miss Ormerod, the post has been made honorary.—J. T. C.

OBITUARY.

Beebee Bowman Labrey.—Mr. Labrey was born June 30th, 1817, at Liverpool; and when about six weeks old was taken to Allonby, in Cumberland, where he stayed till he was about the age of nine. He was then brought to Manchester, where his father lived; and eventually was sent to York School, where so many of our older naturalists have been educated. He was fairly acquainted with various branches of Natural History, but Entomology received his greatest attention; and for some years before his death he had been working out and drawing the plumules found on some families of butterflies; and he has left behind manuscripts and figures which he was intending to have published if he had lived. Two years ago he had the misfortune to have his manuscripts stolen from the railway carriage when on his way to London, and he had to re-write and figure the whole work, which he was able to do from the original specimens of plumules which he had mounted for the microscope. He was very thorough and conscientious in all the work that he did, and he had a great facility not only for drawing, but for learning languages, several of which he spoke and wrote fluently. He was modest and retiring in his nature, though ever ready and eager to encourage and assist the young. He died from the effects of suppressed gout on April 26th, at his country cottage at Disley, Cheshire, and was buried in the churchyard of that place on April 29th. He was a man deservedly respected by all who knew him, as was shown by the number of friends who attended his funeral, many coming from long distances notwithstanding the weather, which was exceptionally stormy.—J. F.

ERRATA.—In the remarks made in the 'Entomologist,' p. 50 of this volume, on plate I., figs. 2 and 2*a*, I find that an error has been committed in the name of the insect figured. I have seen Mr. Ashmead, and he informs me that the insect in question was caught by himself on July 9th, 1881, in company with large numbers of *Argynnis Adippe*, and that he entertains no doubt but that it is of that species, a view in which I fully concur. In the obituary notice of the late Mr. Darwin, p. 101, line 6 from bottom, *for* "spheroid" *read* "special."—J. JENNER WEIR; 6, Haddo Villas, Blackheath, S.E., April 29, 1882.

Thripidæ (Entom. xv. 95).—Mr. Pergande's name should be "Theodor," *not* "Thomas."—E. A. F.

REVIEW.

The Student's List of British Coleoptera. Compiled by FRANCIS P. PASCOE. London: Taylor & Francis. 1882.

THIS small volume of 120 foolscap octavo pages might well have been entitled "A Handbook to the Classification of British Coleoptera," since its utility is likely to be far beyond that of the conventional "List." It contains a synopsis of the families of our British Coleoptera arranged in a dichotomous table, followed by similar tables of the genera, with a list of the British species. Mr. Pascoe commences with the *Coccinellidæ* and the other *Trimera*, following with the *Tetramera*, *Heteromera*, and *Pentamera*, and concludes with the *Cicindelidæ*; thus reversing the general order. The great labour spent in the compilation of these synoptic tables is evident when we consider that there are

207 divisions in the table of genera of the *Staphylinidæ*, 171 in the *Curculionidæ*, &c. Happily the list is not crowded with synonyms; the few necessary citations are, we are told in the preface, from a comparison of Gemminger and Harold's Catalogue with that of Stein and Weise. This gives a good working basis, but we can quite understand that Mr. Pascoe's views on the vexed question of nomenclature will not find favour with extreme "resurrectionists"; when a name has survived without interruption for the last fifty years or so, it has been adopted, Mr. Pascoe having no sympathy with those who would resuscitate a name "supposed to be used in the dark ages of systematic Entomology." In this we think he has used a very wise discretion. He further says—"For myself, I decline to be bound by any absolute rule. When the name is barbarous, or absurd, or the very opposite of the character it ought to express, I take any better name, whatever its claims to priority may be"; and then in a few short paragraphs well illustrates the confusion likely to arise from a strict adherence to the law of priority. With regard to this list of species, we can but express the wish that more minute research had been made into our periodical literature. Of the fifty-nine species to be added to Dr. Sharp's Catalogue (1871), enumerated by Dr. Power at Entom. xi. 62—69, thirty-six are omitted; four of these are admittedly accidental occurrences, and perhaps one or two others may be introduced species. *Harpalus oblongiusculus*, Dej. (Ent. Mo. Mag. xv. 203), and *Latheticus oryzæ*, C. O. Waterh. (Ann. Mag. Nat. Hist. 1880, p. 148, and Entom. xiii. 210), an introduced but at least partially naturalised species, are also omitted.

This 'Student's List' will be almost indispensable to the now too-few workers at our British Coleoptera, and will be of great service to the general entomologist. All are indebted to Mr. Pascoe for its compilation. We trust that he, or some equally competent specialist, may find the time to complete the work so ably commenced, by supplying tables of the species. This by no means light task has already been commenced by the Rev. T. Blackburn in his 'Outline Descriptions of British Coleoptera,' running through eight numbers of the third volume of the 'Scottish Naturalist' (1875—6); a reference would greatly help to Reitter's "Bestimmungs-Tabellen der europäischen Coleopteren," now appearing in the Vienna 'Verhandlungen.'—E. A. F.

NOTES ON CURRENT ENTOMOLOGICAL LITERATURE.

Economic Entomology.—'The Planters' Gazette,' a fortnightly paper devoted to the colonial interests, contains in its issue of April 15th (vol. xxiii., p. 100) an article on "Phylloxera: its History and Results." The object of this communication seems to be intended as a consolation for the coffee-planters of Ceylon and South India, for their losses by the ravages of *Hymellia*, etc., by pointing out the enormous losses suffered by the grape-growers of Europe. A concise life-history of *Phylloxera* is given, which will be of use to colonists who grow grapes. The introduction of new stock vines from other countries is discussed, especially those from America. "It seems remarkable," says the writer, "that whilst France has been deciding in favour of American vines, the Swiss authorities have been visiting every man's vineyard, and rooting up every American plant they could find." Stamping out, by cutting down and burning the vines root and branch, seems to be the only remedy against their enemy that the wine-growers have yet discovered.

Professor C. V. Riley, in the entomological columns of 'The American Naturalist' (May, 1882), as usual, has a choice little entomological *pot pourri* for his readers. He or his contributors have, among others, notes on "Carnivorous Habits of *Microcentrus retinervis*, a locust feeding on beetles;" "First Insect from Wrangell Island," a spider and a larva, the former having proved an undescribed species of *Erigone*, the latter being probably lepidopterous; "Injurious Insects in California;" notes on their extermination by the executive officer, &c.

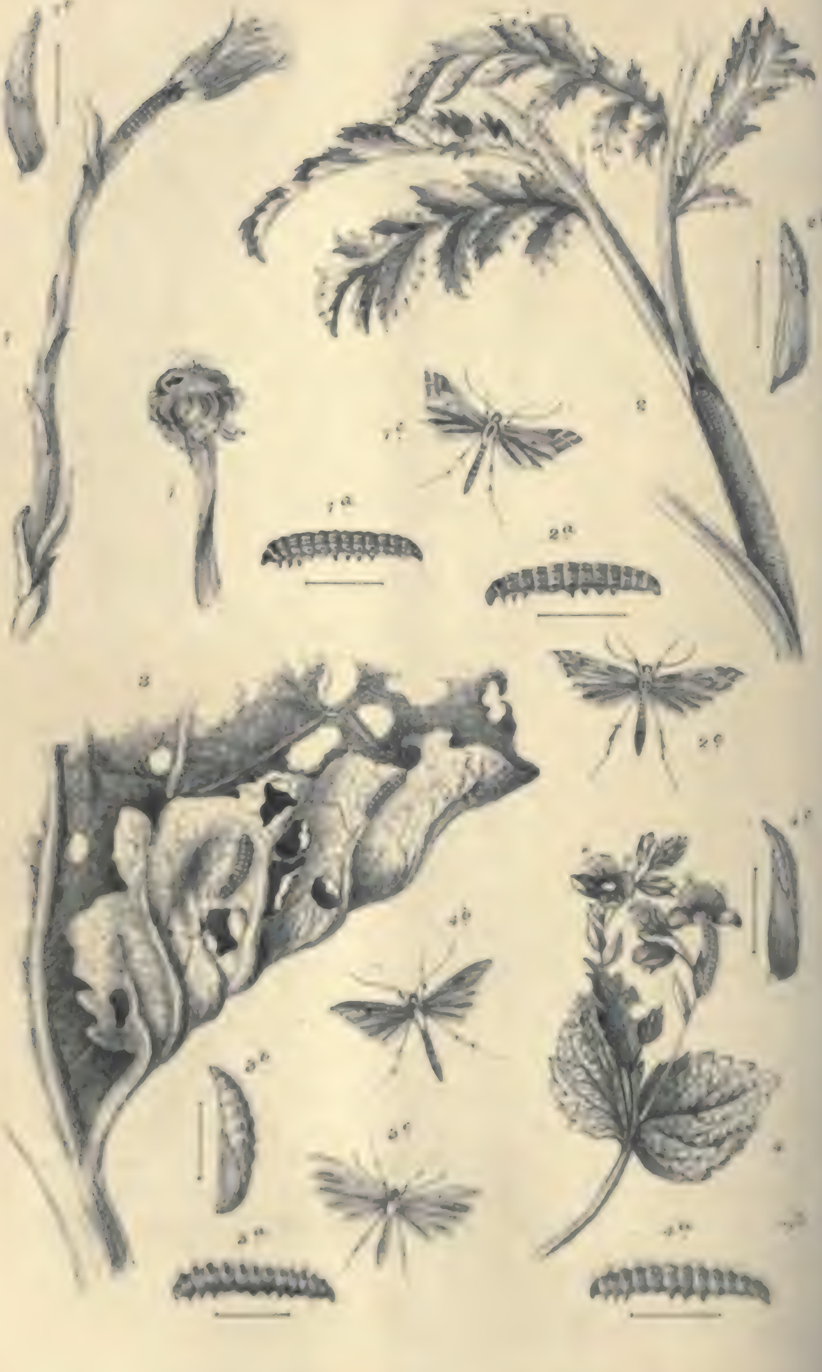
Insects Injurious to Forest and Shade Trees.—The Department of the United States Entomological Commission issues another of the bulletins (No. 7), devoted to the above subject, which is too important a work to receive sufficient notice on this page, and will probably be referred to more fully next month.

Practical Entomology.—Professor J. Henry Comstock has issued a fragment of a 'Guide to Practical Work in Elementary Entomology' (Ithaca, New York: 1882), which he describes as "an outline for the use of students in the entomological laboratory of Cornell University." If Professor Comstock means this as an instalment only of a larger book, we wish he may soon find time to complete it. Nevertheless this is a useful little work, which will be found handy on the work-table of even some of the older entomologists. In his next issue, students would benefit by small woodcuts illustrating the meaning of some of the anatomical parts described.

Entomology in New Zealand.—In the new publication, 'The New Zealand Journal of Science' (Dunedin: Wilkie & Co.), is a paper on the Micro-lepidoptera of that country. The first part appeared in No. 1, February, 1882.

Exotic Insects.—Mr. H. W. Bates, F.R.S., in 'Annals and Magazine' (vol. ix., 5th Series, p. 319), describes "New Species of Geodephagous Coleoptera from North-West Mexico. Mr. Charles O. Waterhouse, in the same volume (p. 321), gives "Descriptions of Cetoniidæ, Buprestidæ, and Cerambycidæ from Madagascar." Again (p. 396), Mr. Distant describes two new Malay Rhopalocera from the Malay Peninsula.

J. T. C.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THE ENTOMOLOGIST.

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CONTRIBUTIONS TO THE HISTORY OF THE BRITISH *PTEROPHORI.*

By Richard South.

(Continued from p. 106.)

Platyptilia trigonodactylus.

(Plate III., Fig. 1.)

In again referring to the life-history of *P. trigonodactylus*, which will be found ante (p. 31), I will add a few additional notes confirmed by recent observation. The young larva feeds in the shoots of its food-plant (*Tussilago farfara*), until the flower-heads are thrown up; then these are attacked. Sometimes the larva will crawl up the outside of a flower-stem and enter the head just above the receptacle, but more often it ascends by way of the interior. In this latter case it does not feed *in* the stem, but makes its way direct to the head. When nearly full fed the larva generally enters a head which has passed or is about to pass into the fruiting stage. It then proceeds to arrest the ripening process by eating away the inner fleshy part of the stem a little below the receptacle. This causes the head to droop until it comes in contact with the scape, against which it hangs in such a manner as to attract the attention of anyone hunting for the larva. When full fed it makes a chamber among the seed down, and enters the pupa state. In causing its domicile to become inverted, the larva not only secures its food in a palatable form, but exhibits wonderful foresight in providing a weather-tight apartment for its pupal condition.

Plate III., fig. 1, coltsfoot (*Tussilago farfara*); 1 *a*, larva; 1 *b*, pupa; 1 *c*, imago of *Platyptilia trigonodactylus*.

PLATYPTILIA. Hub.

Dichrodactylus, Muhlig:

(PLATE III., FIG. 2.)

IMAGO.—Expanse, 12–14 lines. Ground colour or fore wing whitish ochreous, much clouded with cinnamon-brown. The costa is narrowly dotted with dark brown to beyond the middle, where is situated a narrow dark brown linear spot; beyond this the edge of costa is yellowish ochreous, broken by another dark brown spot of variable size and intensity; a small dark brown spot at the digital juncture, and the fissure and hind margins of both digits are outlined with dark brown. Fringes slightly paler shade of ground colour; a tuft of brownish scales at the angle of inner digit, and a smaller tuft on the inner margin. Tip of outer digit produced and slightly falcate. Hind wing, 1st and 2nd feathers brown with a faint purple tinge, fringes paler; shaft of 3rd feather pale ochreous; fringe whitish ochreous at the base and grey towards the edge. Head, thorax and abdominal juncture whitish ochreous. Hind legs whitish, with three brown patches, one small and one large on the tibiæ, and a small one on the tarsi. These markings are only to be observed in *bred* or fresh-caught examples. July.

LARVA.—Length 8 lines, slightly attenuated posteriorly. Head yellowish green, with brownish mandibles, and a black spot on each cheek. Ground colour green. Dorsal stripe whitish, broken at the segmental divisions; a median line of the ground colour is intersected by the darker alimentary canal. Subdorsal and spiracular lines whitish, interrupted at the segmental divisions. Tubercles inconspicuous; dorsal, two rows (four on each segment) blackish, each emitting a single short whitish hair; subdorsal, a row of black warts, each with a single short white hair. Numerous minute whitish bristles all over the body. The spiracles are dark brown, with yellowish centres; anal segment tinged with yellowish and shining. Prolegs and anal claspers semitransparent, with a greenish tinge and tipped with brown. Food, tansy (*Tanacetum vulgare.*) An internal feeder; bores into the stem at the axil of upper leaves, and its presence may be detected by the frass exuded from the point of entry. May and June.

PUPA.—Whitish green, streaked dorsally and laterally with olivaceous brown; thorax humped; from the head is a beak-like projection, which is whitish in front and blackish at the sides; the lower portion of antennæ-cases are detached from the abdomen.

In confinement suspended by the tail from under side of leaf of food-plant. June.

Plate III., fig. 2, tansy (*Tanacetum vulgare*); 2 *a*, larva; 2 *b*, pupa; 2 *c*, imago of *P. dichrodactylus*.

I have to thank Mr. Sang, of Darlington, for kindly sending me larvæ of this species.

ACIPTILIA, Hub.

Galactodactylus, Hub.

(PLATE III., FIG. 3.)

IMAGO.—Expanse, 11–12 lines. Fore wing white, sprinkled with minute brownish scales towards apex; a small blackish spot on the costa beyond the middle, and a smaller spot a little below it, but nearer the tip. A small black spot at the digital juncture, another towards the tip of inner digit, and one between them on the inner margin; there is also a small blackish dot midway between digital juncture and base of wing. Fringes white, tinged with dark grey round the tips, and with a very conspicuous black patch in the fringes of inner digit. Tips of both digits acute, that of the inner deflexed. Hind wing white, sprinkled with brownish scales; fringes white tinged with grey. Tip of 3rd feather-shaft black. Head and thorax white. July.

LARVA.—Length, 5–6 lines; tapers towards anal extremity. Head smaller than 2nd segment, whitish green, with light brown mandibles and a black spot on each cheek. Ground colour pale pea-green; segmental divisions whitish. Dorsal stripe broad whitish, intersected by a median interrupted line of the ground colour. Tubercles, dorsal, two on each segment, placed on the outer edges of the dorsal stripe, each with a tuft of moderately long grey hairs; subdorsal, one on the posterior edge of each segment, with a few short hairs. Spiracular area, a wart on the middle of each segment, button-shaped, transparent and very prominent, with a tuft of long silky whitish hairs. Food, burdock (*Arctium Lappa*); eats holes in the leaves from the under side. May. When the leaves of burdock growing in or near woods are observed to have a riddled appearance, the younger leaves should be carefully turned up and the under sides examined for the larva of the "plume" under consideration.

PUPA.—Pale green; warts arranged as in the larva; hairs whitish, but not quite so long as in the larval stage; a short black bar or linear spot on the 2nd–6th segments inclusive, most conspicuous on the 5th. May and June.

I have given May as the month for the larvæ of this species, but they may be found from the middle of March if the weather is mild; but of course they will be then very immature.

Plate III., fig. 3, burdock (*Arctium Lappa*); 3 *a*, larva; 3 *b*, pupa; 3 *c*, imago of *A. galactodactylus*.

I am obliged to Mr. Walter W. Walter, Stoke-under-Ham, Somerset, and to Mr. Mann, of Clifton, for kindly supplying the larvæ of this plume moth for figuring and description.

MIMÆSEOPTILUS, Wallgn.

Pterodactylus, Linn.

Fuscus, Ritz.

Fuscodactylus, D.L.

(PLATE III., FIG. 4.)

IMAGO.—Expanse, 11 lines. Ground colour of fore wing cinnamon-brown, darker brown along the outer digit, and the costal margin dotted with black to the middle. The markings are inconspicuous, a short streak from the base nearly to the middle of wing formed of blackish dots, and a blackish twin-spot at the digital juncture; a minute black spot at the angle of outer digit, and two others near tip of inner digit, are the only distinct markings. Fringes rather greyer than the ground colour. Tip of outer digit acute and produced. Hind wing brown, with a purple tinge; fringes slightly paler. July.

LARVA.—Length 5 lines, slightly attenuated towards anal extremity. Head smaller than second segment, whitish, with a tinge of green and much spotted with blackish; mandibles brown, ground colour green; segmental divisions yellowish green. Dorsal line dark olive-green; subdorsal and spiracular lines whitish. Tubercles, two dorsal rows (four on each segment) with tufts of moderately long hairs, one hair of each tuft rather longer than the others, whitish; subdorsal, one on each segment, with a tuft of short hairs. Spiracular, one on each segment, with a few moderately long hairs. Prolegs and claspers semitransparent, with a green tinge; the former spotted with brown and the latter tipped with black. Food, germander speedwell (*Veronica Chamædrys*.) When young, feeds in the shoots, afterwards on the flowers, eating the petals. May and June.

PUPA.—Anterior portion whitish green, posterior portion whitish, suffused laterally with brownish. A narrow reddish dorsal line may be traced most distinctly in the region of thorax and hinder segments of body. Head truncate; eyes prominent, yellowish; thorax humped; body rounded; wing-cases have their lower third detached from the body. June and July.

Plate III., fig. 4, germander speedwell (*Veronica Chamædrys*); 4 *a*, larva; 4 *b*, pupa; 4 *c*, imago of *M. pterodactylus*.

I have generally found the larva of this species on the plants of speedwell growing on sunny banks, old walls, and such localities, and the perfect insect may be readily obtained by beating, or rather stirring, the herbage in these places.

It will be observed that descriptions of the larvæ of two species, viz., *M. pterodactylus* and *A. galactodactylus* have already appeared in these pages; but it has been thought desirable to re-describe them so as to follow a certain uniform style, that may facilitate identification in connection with the figures on the plates. I shall be always most happy to acknowledge assistance in matter or material for these papers from contributors to the 'Entomologist,' but venture to suggest that while these "Contributions to the History of British Pterophori" are appearing, independent descriptions of "Plume" larvæ, concurrently published in the same pages, may lead to confusion.

(To be continued.)

NATURAL LOCALITIES OF BRITISH COLEOPTERA.

By Rev. W. W. Fowler, M.A., F.L.S.

No. V.—THE SEA-COAST.

The beetles to be found on the sea-coast are so numerous, and in many respects so peculiar both in their nature and in their habitats, that it takes a long time to gain the experience necessary for working them to much advantage. A collector, however, who has hitherto collected only inland, will soon feel the sensation of delight that an Entomologist alone can feel, as he realises how totally different are the characters of the sea-coast and inland fauna. Each sea-coast district, too, has its peculiar species, and every fresh place near the sea which one visits is sure, if worked, to produce something new and rare, and very often in abundance; thus, some time ago, I got over a hundred specimens of the rare *Saprinus immundus*, at Hunstanton. Last year I found *Phytosus balticus* (not before recorded from Lincolnshire), in numbers at Mablethorpe; and last Easter I took *Ceuthorhynchidius Dawsoni* in profusion near Ventnor. The great secret of all working is, when you have found a good beetle, not to leave the spot in hopes of finding more further on, but to note carefully the circumstances under which you obtained the first, and work patiently until you have discovered their habits. A good deal of time may seem wasted, but when you have once found out the secret you will probably soon make up the time a hundredfold.

Although we have lately heard from Mr. McLachlan of a marine caddis-fly, and cannot of course, after this, tell what discoveries may be made, yet, so far as we know, no beetles are actual inhabitants of the sea. One or two rare beetles, however, as *Actecharis Readingi*, almost have a claim to the title, as they live on seaweed that is very nearly always immersed. A great number of Coleoptera are habitually found below high-water mark: some are covered by the tide, and we need not wonder at its not injuring them, when we remember what has been said about the beetles found in floods. Many draw back before the tide and return as it recedes: these beetles inhabit the shingle and the layers of rotting seaweed that are so often mixed up with it. Many good Staphylinidæ may be found in such localities, as for instance, *Lithocharis maritima*, *Philonthus fucicola*, *Homalota princeps*, *puncticeps* and *plumbea*, *Myllænæ*, *Tachyusa urida* and *sulcata*, *Diglossa mersa*, *Bryaxis Waterhousei*, &c. The easiest way to work the shingle beetles is to examine the larger stones and rocks on a warm day, when the beetles may be found coming up from the shingle and running upon them, and may be taken in numbers. I have taken several of the above-mentioned beetles, and a good many *Ptenidium punctatum* with them, in this way, in the Isle of Wight. Heaps of seaweed just above high-water mark are very productive, if shaken over paper; farmers, too, often gather large heaps in the adjacent fields for manure,—these swarm with beetles in warm weather, chiefly Staphylinidæ, but *Bryaxis Helferi*, and good species of *Corticaria*, *Atomaria*, and other genera may often be found.

Collecting under stones on and near the beach is profitable. The curious *Lymnæum nigropiceum* is only found in shingle: still it prefers shingle under stones, as also do *Trechus lapidosus* and *Æpys*. Under the stones well above high-water mark and on the cliff sides many good species of *Harpalus* occur, and in many places in the south *Brachinus crepitans* is very abundant. Other Carabidæ, such as *Polystichus*, *Drypta*, &c., are found not far from the coast. Some beetles, like *Broscus*, which swarm on or near the shore in many places, are occasionally found far inland, so that in some few cases it is hard to say whether a beetle is exclusively a coast species or not. Many Hemiptera, too, are found under and at the sides of stones among herbage close to the shore, as *Podops*, *Ælia*, *Coreus*, and others.

Sandhills are extremely productive: the rushes and thick grass with which they are usually covered have generally, on a favourable day, a good many species upon them, but sweeping does not produce much, as the grass is so thick and stiff that the beetles are nearly all knocked off before the net reaches them. The best plan is to beat the rushes sharply, and then examine the sand underneath. By doing this I found one or two species I wanted in abundance, last year, at Mablethorpe. The larger species, as *Cteniopus*, *Sitones*, and others, and conspicuous Hemiptera, as *Therapha*, may be picked off with the hand. The brown species of *Cicindela* are sometimes abundant in such localities. On some large sandhills, as at Tenby, there are a lot of thyme banks in the hollows, and if the roots of these be loosened (especially where the plants overhang the numerous paths) a great number of species will come tumbling out, *Calathi*, *Harpali*, and many others. The best beetle I took in this way at Tenby was *Harpalus melancholicus*.

The sheltered hollows, just away from the sea, produce very good things, as the vegetation there is not nearly so rank, and much more diversified. The sweeping-net can here be used with advantage, and many good Curculionidæ, Coccinellidæ, Halticidæ, &c., may be found. By examining the damp sandy places often found among these hollows *Bledii* may be obtained in abundance (*B. opacus*, *B. spectabilis*, *B. tricornis*, and others), and sometimes very rare species as *Anthicus bimaculatus*. The *Bledii* are burrowers, and almost always live in companies, so where one is seen more should be looked for: they may often be found by the little casts they throw up on the sands.

Moss on sandhills is also worth examining for Staphylinidæ, *Agathidia*, and many of the small genera.

The sandhills of Deal and the adjacent coast are especially celebrated for good species, notably *Lixus bicolor*, and also for many species of Hemiptera, as *Odontoscelis*, *Eurygaster niger*, *Sciocoris*, *Pseudophlæus*, *Chorosoma*, and many others. Some very good Lepidoptera, too, occur at the same place.

The ground underneath plants on the shore and adjacent cliffs should be carefully examined: many of these plants are too large for the sweeping-net, and on being touched every beetle drops at once. On examining the soil at and about the roots, numbers may be found—chiefly Curculionidæ. Many beetles live actually at the roots, and may be found by pulling up the plants bodily and shaking the roots over paper. Thus *Otiorhynchus ligustici* lives at the roots of *Anthyllis vulneraria*, *Ceuthorhynchus verrucatus* at the roots of the yellow horned poppy, and many others have their peculiar plants, so that some knowledge of Botany, it may be easily seen, is absolutely necessary for a collector.

Very heavy rain is apt to spoil cliff-collecting by washing out many of the insects. This is very annoying if one only has a limited time by the seaside. If, however, the rubbish and long grass at the bottom of the cliffs be pulled about and examined, it will be found that many species will have gathered there. Sandy cliffs are very productive; clay cliffs not nearly so much so. The clay cliffs, however, have some good species peculiar to themselves, as *Nebria livida*, which I have obtained in abundance in the cracks of the clay cliffs at Bridlington, Yorkshire; its congener *Nebria complanata* is found hardly anywhere except on the flat burrows near Swansea. Usually there are sandy spaces in the middle of the clay cliffs, and these produce numbers of insects: in such a spot, near Bridlington, I once obtained, among a number of commoner species, *Harpalus tenebrosus*, *Dyschirius angustatus*, and *Bledius erraticus*, all entirely new to that part of the country. The names of these two latter beetles make me mention the fact that the two genera have some affinity, for they are usually found together; wherever therefore a good *Dyschirius* is found, a good *Bledius* should be looked for, and *vice versâ*.

In conclusion, I would say that the estuaries of tidal rivers, where the water is half salt and half fresh, are exceedingly profitable localities to work, and occasionally on a hot day in summer enormous quanties of *Carabidæ* (among them good species like *Pogonus luridipennis*, which is a true estuary beetle) may be found running actively on the mud reaches, or resting under the heaps of seaweed and refuse that always gather in such localities.

This paper might be extended to a much greater length, and there yet remains something to be said about sweeping in the neighbourhood of the coast; but sufficient hints have been given to enable a worker at the sea-coast to find something at all events, and, as he goes on collecting, he will be sure to gather fresh ideas from his own experience.

Many people at this time of year go to the seaside for a holiday, and when they get there are entirely at a loss how to occupy themselves. If such would only take up the study of some branch of natural history, they would find their enjoyment greatly increased, and would further find, in the objects they have collected, a pleasure that would endure long after their holiday had come to an end.

The School House, Lincoln, June 6, 1882.

FURTHER NOTES ON NORTH DEVON.

By Richard South.

I have just returned from a sojourn of some weeks among the "burrows," "combes," "tors," and "hoes" of North Devon, and think a few notes on my entomological experience whilst there might not be without interest.

The past mild winter, and more especially the early spring, had induced me to anticipate a good collecting season, on the ground of my last season's campaign, but I was disappointed. I expected certain species to be on the wing at least a week *earlier* than they were last year, but instead of this they were actually *later* by eight or nine days than last year's dates. The weather too, during the latter half of May and the first fortnight of June, was not altogether of that character best suited to the capture of Lepidoptera, for quite two-thirds of the days were either wet or windy, or both; and the nights as a rule were clear and cold, even frosty. Sugar was consequently almost an entire failure; on one night only (June 3rd) did moths come in any number to the sweets. The following day a big thunder storm upset the atmospherical equipoise, and the wind blew with considerable force from the south-west to north-west for several days afterwards. Indeed it was not until the 12th that the weather became again anything like settled, but it then only took a day's rest, for on the morning of the 13th commenced another squall, which continued until the 16th, when I metaphorically struck my tent and beat a retreat.

Argynnis Euphrosyne was not so abundant as its congener, *A. Selene.* This latter was to be met with in every copse near water, and by the side of most brooks whenever the sun shone; females were rarely met with.

Melitæa Athalia.—Larvæ of this species were found feeding on yellow cow-wheat (*Melampyrum pratense*) and foxglove (*Digitalis purpurea*); the former plant seemed the favourite food. On the 5th of June three imagines of the species were captured, and others afterwards to the 12th of June, on which date larvæ were still found.

Zygæna filipendulæ was very abundant in the larval stage at Braunton, on June 14th. At the corresponding date last year a few imagos were out, and there were plenty of cocoons, but not a larva was to be seen.

Nudaria mundana.—The larvæ of this species were of frequent occurrence on old moss and lichen-covered walls, and even on rocks by the sea.

The larvæ of *Boarmia repandata* were not nearly so numerous as last year, and many of them were only half grown on the 10th of June, at the same time I captured the imago. This incident well illustrates the eccentric character of the season and its influence on larvæ. Again, on the 12th of June I took three specimens of *Cidaria populata* (one of these very worn). I had observed larvæ of this species on the 7th of that month.

A few larvæ of *Toxocampa cracca* turned up in another locality, about two miles from where I found it last year. At its old locality, which was fully exposed to the gale we had in April last, the food plant *Vicia sylvatica*, evidently suffered, together with the surrounding herbage and tree foliage, having almost disappeared.

Plusia gamma was of frequent occurrence both by day and night, and reminded me of my experience of the insect in the Isle of Wight, in 1879; there desultory examples of the species were met with in May and June, in all sorts of places, and at all hours of the day. The following August the insects were in thousands. That season was in many respects, as regards its meteorological aspect at least, identical with the present. I have not my diary at hand, but I have a very lively recollection of the kind of weather which prevailed in the Isle of Wight, from May to August, 1879.

Last year I remarked the absence of *Tortrix viridana*, but judging from the quantity of larvæ of this species observed feeding on the oaks, the imago should not be scarce in North Devon this year. Some of the oak trees were nearly defoliated, and a flock of jackdaws were doing their best to check the ravages of the caterpillar upon the leaf-crop, by transferring them —the caterpillars—to their own crops.

Stigmonota redimitana was not scarce among oak, but difficult to get, owing to wind.

Ephippiphora turbidana did not appear till after June was well advanced, and then only in batches of three or four at a time, whereas last year it was to be taken a dozen or so on a day, at the end of May.

On the 20th of May, whilst working in a small oak copse, I struck at a small example of the *Tineina*, and in doing so my net brushed the low branch of an oak tree, from out of which came quite a cloud of *Micropteryx Thunbergella.* I of course made a sweep at these, and netted two dozen or more, all of which appeared perfectly fresh. Having boxed as many as I could from the first "catch," I jarred all the branches within reach and disturbed numbers of the insect. They seemed, however, only to occur amongst the foliage of the tree I had accidentally shaken. For several days after this wet and windy weather prevailed, and I did not visit this particular copse again until about the end of the month, when I met with *M. Thunbergella* occasionally, but only single specimens in indifferent condition were beaten out of various trees and undergrowth. Strange to say, the oak tree which yielded the insect in such abundance on the former occasion did not now appear to harbour a specimen. The possibility of oak being the food of this species seems strongly indicated, from the fact of its being in such numbers thereon when the specimens were in fine condition.

The other species of *Tineina*, as far as I have determined them at present, captured in North Devon, are as follows:— *Lampronia luzella, Micropteryx calthella*; of this last-mentioned species from three to eight examples at a time were boxed from flowers of the common buttercup (*Ranunculus bulbosus*), growing by the roadsides near water. *M. aruncella*, a few specimens by sweeping herbage. *M. Seppella*, resting in flowers of speedwell, (*Veronica Chamædrys*), on sunny banks, often several females on a flower; the male was rarely met with. *M. allionella*, from among bilberry; these were found settling on the leaves of nut, &c., in the early morning sunshine. *Nemotois Swammerdamella* and *N. Schwarziella* were both common, the former especially so.

Adela fibulella was frequently found resting in flowers of speedwell, and flying actively in the sunshine. *A. rufimitrella* was obtained by sweeping grass, &c., in the water meads, but only where *Cardamine pratensis* grew. One specimen of *A. Sulzella* at rest on a dock leaf, and *A. viridella* was abundant in oak copses. *Gelechia luculella*, flying high late in the afternoon. *Œcophora Lambdella* was bred from dead furze sticks. The best way to breed this species is to collect dead furze sticks, in any locality where the insect is known to occur; the wood should have the bark on, and the more decayed this is the better chance of *Œ. lamdella* being there. It is better not to examine the sticks for the pupæ, for, in nine cases out of ten, in stripping off the bark the pupa will, if present, be destroyed; at least, such was my experience, I grieve to say.

Glyphipteryx Thrasonella, common in a water mead. *G. equitella*, one example netted casually; plenty of stonecrop grew all over the district, so this species should have been common. I remember seeing a number of the insect in a garden in Camden Road, London, two or three years ago, among stonecrop.

Argyresthia nitidella and *A. conjugella*, the latter among mountain ash, but more often beaten out of heather in the vicinity of the shrub. With these I must conclude my list of the *Tineina* found in North Devon. As I have already stated, I took several other species, but have not yet identified them.

I append a list of spiders found in North Devon:—

ARANEIDEA.—*Harpactes Hombergii*, Scop., *Linyphia hortensis*, Sund., *Meta segmentata*, Clk., *M. merianæ*, Scop., *Tetraquabba extensa*, Linn., *Epeira cornuta*, Clk., *E. cucurbitina*, Clk., *Misumana vatia*, Clk., *Xysticus cristatus*, Clk., *X. lanio*, C. L. Koch, *X. luctuosus*, Bl., *Philodromus aureolus*, Clk., *Micrommata virescens*, Clk., *Ocyale mirabilis*, Clk., *Trochosa picta*, Hahn (alive), *Lycosa lugubris*, Walck., *Hasarnis falcatus*, Clk.

PHALANGIDEA.—*Urgabunus insignis*, Meade.

The collection was made by Mr. Edward Matthews and myself, and forwarded to the Rev. O. Pickard-Cambridge, who has been good enough to furnish the above list of the species.

With regard to *Micrommata virescens*, Clk., Mr. Pickard-Cambridge, says,—"These are fine examples, two males and three females. I find the females and immature males here and in many other places, but have never yet met with the male adult but once."

12, Abbey Gardens, St. John's Wood, N.W., June 24, 1882.

INTRODUCTORY PAPERS ON LEPIDOPTERA.

By W. F. Kirby.

Assistant in the Zoological Department, British Museum.

No. XVIII. NYMPHALIDÆ—NYMPHALINÆ.

(Continued from vol. xiv., p. 176.)

LIMENITIS AND ITS ALLIES.

The first genus of this group is *Lebadea*, which contains a few brown or tawny East Indian species, shaped much like *Limenitis*, but with the hind margin of the fore wings more decidedly concave. They are more or less distinctly banded or festooned with white, and the tips of the fore wings are always white, a character which will serve to distinguish them from any of the allied genera. They expand rather over two inches.

We now come to *Adelpha*, a large tropical American genus, one species of which extends as far north as California. The great majority of the species are of moderate size, brown, with a white band crossing the middle of the hind wings, and extending over part, at least, of the fore wings. On the costa of the fore wings is nearly always a fulvous band or blotch, sometimes opposite the end of the white band, and sometimes outside it, and often divided into spots by the veins. Sometimes there is a tawny band on the fore wings, and a white band or no band at all on the hind wings; and in one or two instances the fore wings are banded with red, and the hind wings are brown. The wings are shaped nearly as in *Limenitis*, but are generally somewhat dentated, and the fore wings are shorter; in some few cases the hind wings are tailed, and in others the butterflies closely resemble some of the South American species of *Apatura* in size, shape, and markings.

Turning now to the familiar genus *Limenitis*, we find it numerously represented in the northern hemisphere, but almost totally absent from South America and Africa, being represented in the former country by *Adelpha*, and in Africa by *Aterica*, *Cymothoe*, and other allied genera. Most of the known species of *Limenitis* are marked with a more or less continuous transverse band of white, and many of them equal or surpass our European *L. Populi* in size. The ground colour is nearly always brown; in a few instances, however, the greater part of the wings is fulvous, with few or no white markings, as in *L. Lycone* from Celebes, and in the remarkable North American *L. Archippus*, which closely resembles *Danaus Erippus* in colour, though it is a considerably smaller butterfly. This insect is said to extend its range to Venezuela, and is thus the only species of true *Limenitis* recorded from South America. *L. Artemis* is another well-known North American species: it is brown, with bluish suffused markings on the upper side, especially towards the hind margin of the hind wings, and with submarginal orange spots on the under surface, in addition to several other orange spots nearer the base. *L. Zayla* is one of the largest of the East Indian species: there is a white band on the hind wings only, the pale band on the fore wings being broadly fulvous. *L. Darasa*, another Indian species, rather larger than our *L. Sibylla*, has a narrow green band, which is broken into spots towards the tip of the fore wings.

The species of *Neptis* are very numerous in the East Indies. They are generally black or brown, with white or yellow markings, arranged nearly as in the European species. The species of *Athyma* and *Abrota*, which are also East Indian, are very similar, but are larger and more robust insects, with a broad interrupted white or tawny band on the fore wings, and one or two continuous ones on the hind wings; there is generally a long basal streak of the same colour on the fore wings. In many cases the males are marked with white, and the females with tawny.

Euphædra is a beautiful African genus, including species which measure about three inches across the wings, most of which are of a deep velvety black, suffused with bronzy green on the hind wings and on the adjacent portion of the fore wings, and generally with a white or yellow bar across the tips of the latter. One species, however (*E. Eleus*, Drury), is red, with a broad black white-barred tip to the fore wings, and black borders to the hind wings.

Euryphene is another African genus. Many of the species much resemble those of *Euphædra*, while in others the males are brown and tawny, and the females are tawny brown, with the tips of the fore wings broadly brown, and spotted or barred with white. In one curious species (*E. Arcadius*) the fore wings are green, with several rows of whitish spots, and their base and the hind wings are of a purplish brown.

Hamanumida Dædalus is a common African butterfly, measuring about two inches across the wings. It is brown, speckled all over with white, giving it, as has been frequently observed, some resemblance to a guinea-fowl. It is said to differ in tint, according to the colour of the soil on which it occurs.

Cymothoe is another African genus, including species expanding from two to four inches. The males are generally of a buff colour, deepening in some species into rich tawny or almost fulvous; the females are black, with more or less extended white markings. In *C. Sangaris* and *Uselda*, however, the males are of a deep blood-red colour; the female of the latter is black, suffused with orange towards the base, and with zigzag whitish markings towards the outside of the wings.

Aterica includes smaller species, likewise all African, generally expanding under two inches. The males are blue or fulvous, with rows of brown spots, more or less connected into bands; the females are brown, with buff markings. In *A. Cupavia*, however, the male is black, with three yellow spots across the tip of the fore wing, and a broad yellow band on the hind wings; in the female these markings are white.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Colias Edusa at Ely.—As very few specimens of this butterfly were recorded last autumn, your readers may be interested to learn that I captured one on June 25th this year, quite close to Ely. From the damaged state of its wings it appears to be a hybernated individual. It is a male, but in expanse of wings considerably beyond the average of that sex. I am sure that I shall not be alone in expressing a hope that it may only be the precursor of many autumnal representatives of this species.—Harold Harris; King's School, Ely, June 25, 1882.

Apatura Iris in Northampton.—I found on June 1st, at Yardley Chase, two larvæ of *Apatura Iris*, which turned to pupæ on June 15th and 16th.—F. J. Rasell; 30, Argyle Street, St. James' End, Northampton, June 22, 1882.

Hesperia paniscus at Barnwell Wold.—In reference to your remarks in the 'Entomologist' for June on the disappearance of *Hesperia paniscus* from Barnwell Wold, I may state that having visited the locality on Whit Monday we were unsuccessful in finding *H. paniscus* in the wood. In a field near, however, a pair were seen, one only being captured.—THOS. G. FRASER; 6, Kerr Street, Northampton, June 5, 1882.

ON THE FEMALES OF LYCÆNA ADONIS AND L. CORYDON.—It seems to me that there is not any difficulty in distinguishing these insects one from the other, or in determining to which species a solitary specimen may belong. Undoubtedly the fringe is one of the tests, and an unfailing one too, and is aptly described by your correspondent; it seems also to be a trifle broader in *L. Corydon* than in *L. Adonis*. May I venture to remark in addition to this that, so far as my observation goes, *L. Adonis* always has a blackish ground colour, and invariably bright red spots (unless absent altogether); whereas the ground colour of *L. Corydon* is brown, sometimes approaching to slate- or lead-colour (highly glossy in fresh specimens), and the spots are of a dull red-brown, varying to pale ochreous. The scales, too, with which each is dusted or sprinkled (most in *L. Adonis*), are of the same tint as the respective males. On the under side, *L. Corydon* has by far the boldest spots, and a more striking appearance than *L. Adonis*, and is normally the larger insect of the two. I say nothing of times of emergence, as this would be of no service to those who are not in the habit of taking these species themselves. I shall be glad, if incorrect, to receive further enlightenment from your readers.—E. SABINE; 17, The Villas, Erith, June 12, 1882.

DANAINE BUTTERFLIES NOT SUBJECT TO THE ATTACK OF MITES.—In the 'Proceedings of the Entomological Society for the year 1877,' p. xii., Mr. Meldola remarks that "he had observed that certain distasteful species of Lepidoptera preserved their disagreeable qualities after death, in proof of which he exhibited some butterflies found among an old collection of Indian insects, the greater part of which had been demolished by mites. The surviving specimens were all of protected species, viz., four of a *Euplœa*, one of *Danais plexippus*, and one of *Papilio pammon*. *Euplœa* and *Danais* were well known to be protected genera, since they serve for models of mimetic resemblances. With regard to *Papilio pammon*, Mr. Meldola stated that, in his belief, it was in some way distasteful, as he had seen it in swarms on the Island of Nancoury, Nicobar Islands, in April, 1875." In

Mr. Meldola's valuable translation of Dr. Aug. Weisman's 'Studies on the Theory of Descent,' p. 337, the translator, in a footnote, makes a similar statement. I lately became possessed of four cases of Indian Lepidoptera, which had been almost entirely destroyed by mites, but the Danaine butterflies were uninjured: there was one species of *Euplœa* and four of *Danais*, including *D. chrysippus*, *D. limniace*, and *D. plexippus;* the specimens of *Papilio pammon* were also in fair condition.—J. JENNER WEIR; Haddo Villas, Blackheath.

SMERINTHUS TILIÆ, *var.*—On June 8th a brother of mine captured a female *Smerinthus tiliæ*, of which, as it differs somewhat from the ordinary types of this insect, I append a description:—The usual dark green band across the centre of the fore wings is entirely absent, save for a large dark green pear-shaped spot in the centre of the wing, the apex pointing to the outer margin of the wing. The colour of the wings, from the thorax to about an eighth of an inch beyond the above-mentioned spot, is sienna-red, and beyond this of the usual normal colouring. —GEORGE T. ADAMSON; June 10, 1882.

MELANTHIA ALBICILLATA *var.* SUFFUSA.—I have to record that I have succeeded in obtaining, by breeding, a second example of *Melanthia albicillata* var. *suffusa.* On comparing it with the figure in the 'Entomologist' for May, 1881, I find the resemblance to be so perfect that it might have been drawn from the specimen now in my collection.—T. MELDRUM; Ripon, June 16, 1882.

PHIBALAPTERYX POLYGRAMMATA NEAR ROMSEY.—In the May number of the 'Entomologist' I stated that I had taken *Phibalapteryx polygrammata* in this neighbourhood. I have since learned, through the kindness of Mr. A. B. Farn, that my species is *P. lignata*, I having been misled by the transposition of the figures in Newman's 'British Moths.' I am very sorry that the mistake should have occurred.—E. BUCKELL; Ivybrook House, Romsey, May 30, 1882.

STAUROPUS FAGI IN DORSET.—I was fortunate enough to capture a fine specimen of *Stauropus fagi* on a tree trunk in a wood near here, on June 12th. I should be glad if any one could inform me whether there is a known British representative of the "Praying Mantis" of the tropics, as I have lately met with a minute insect which seems to be exactly like the foreign one in form.—F. O. PICKARD-CAMBRIDGE; Warmwell, Dorset.

ACRONYCTA ALNI IN THE NEW FOREST.—The other day I met Mr. Blanchard, of Parkston, who informed me that he had just succeeded in breeding ten fine perfect imagines of *A. alni*, from larvæ collected by himself in the New Forest last season. This is a most hopeful and encouraging sign to other frequenters of the New Forest.—W. M'RAE; Bournemouth, June 21, 1882.

PACHETRA LEUCOPHÆA AT BOX HILL.—On the 22nd ult., in company with the Messrs. Church, I visited Box Hill, and took a female of *Pachetra leucophæa* at rest on the trunk of a white-thorn. It deposited eggs, which have duly hatched, and are feeding well on *Poa annua*.—B. ARTHUR BOWER; Eltham Road, Lee, S.E., June 18, 1882.

CATEPHIA ALCHYMISTA NEAR DOVER.—Calling on Mr. Davis yesterday morning to report on the curious moth I showed you in London, I found him busy setting his captures of the night before. They consisted of varieties of *Agrotis exclamationis*, with the exception of a gloriously perfect and fresh specimen of *Catephia alchymista*. The workable woods for sugar are, as a rule, singularly unproductive, and at some distance from the town of Dover, so it is gratifying to think that the perseverance and zeal of an enthusiastic artisan have at length been rewarded by taking such a rarity.—SYDNEY WEBB; 3, Luther Terrace, Dover.

PSYCHE VILLOSELLA.—I took two males of this species at Lyndhurst in June, 1880. I found them at rest on a fence.—L. F. HILL; 4, Craven Terrace, Ealing, W.

NOTES ON THE SEASON.—This is, without exception, the worst season for insects I remember during all my entomological experience. Comparatively speaking there are none. *Fidonia piniaria*, which in our woods used to be in such extraordinary numbers, seems almost to have disappeared. Again at Edlington Wood, where two years ago, and again last season, *Asthena sylvata* was to be seen at rest literally by hundreds—so many as twenty on a single tree—it has appeared only in the most limited quantity. In one whole day's collecting I only saw four specimens. The same applies to *Abraxas ulmata*, *Melanippe hastata*, and *Epione advenaria*, in the same locality. Although I have given sugar a fair trial in several localities in Yorkshire, it has proved quite useless; frequently not a moth appearing. The absence of butterflies is also most remarkable. The mild winter has undoubtedly enabled the natural enemies of insects to clear away the greater part of the larvæ and pupæ, hence the rarity of Lepidoptera; but it is to be hoped that we shall have a good autumn season. To our local fauna we have to add *Scoparia basistrigalis*, one specimen being taken at Sandburn Wood. It has previously been taken near Selby and Doncaster, but not before so near York.—W. PREST; 13, Holgate Road, York, June 26, 1882.

ICHNEUMON OF CHELONIA PLANTAGINIS.—To-day, when taking a fairly good specimen of *Chelonia plantaginis* off the setting-board, I found an ichneumon larva (about half an inch long) spun up between the insect and the board, and saw a large hole in the abdomen of the insect, out of which it had evidently come.—C. E. NEWNHAM; Chippenham, June 8, 1882.

[May we suggest that our correspondent sends the ichneumon pupa to Mr. Fitch, Brick House, Maldon, Essex, who will doubtless let us hear more of its history.—ED.]

PANISCUS TESTACEUS, *Grav.*—A few notes on the life-history of *Paniscus testaceus* may not prove uninteresting to those who study our British parasitic insects. On June 14th of last year, in examining some larvæ of *Dicranura vinula*, I noticed a few little black shining objects hidden between the rolls of skin close behind the head. Suspecting that these objects were connected with some parasite I determined to leave them unmolested, having ascertained that they were firmly imbedded in the body of the animal, and that only half of each was observable, like an egg in an egg-cup. About a fortnight after this one of the black objects hatched, and the rest soon followed suit. The larvæ thus issued into the world were fat, footless, greenish white, semi-transparent creatures, attached head and tail to their host, swaying about with his every movement. Most of the *D. vinula* larvæ were so weakened by the attack that they died before reaching the pupal stage; but one survived, and built up a cocoon towards the end of August, the parasites being then—I write from memory—about a quarter of an inch long, and very fat and flabby. Towards Christmas I broke open the pupa-case, and found inside five long, spindle-shaped, dark brown cocoons, measuring from half to three-quarters of an inch in length, each sparingly enclosed in silk. In the midst of these was the skin of the hapless *D. vinula* larva, who had been sucked quite dry by his uninvited guests. The perfect insects emerged on May 19th, and proved to be

Paniscus testaceus. I have not seen any notice before of this external parasitism of *Paniscus*, and had previously considered that the ichneumons were internal parasites.—E. W. ANDREWS; University School, Hastings, May 30, 1882.

[Compare George Newport's life-history of *Paniscus virgatus*, Fourc., parasitic on *Hadena pisi* (Trans. Linn. Soc., vol. xxi., pp. 71—77, pl. viii., figs. 13—19; 1852). Also see Entom. xi., p. 251.—E. A. F.]

ODYNERUS PICTUS, *Curt.*—I am now able to complete the life-history commenced on July 18th, 1881 (Entom. xiv. 188). One of the larvæ, out of the four I brought home on July 13th, changed into the pupa state on May 4th, and was then of the same light cream-colour as the larva; on the 16th the eyes were black, and ocelli dark brown; by the 22nd the thorax became dark; by the 24th the thorax was black, and the abdomen very dark; on the 28th the abomen was black, the rings smoky white; 31st, clypeus and bands on the abdomen yellow; June 2nd, emerged from the pupa state within the cocoon, and apparently ready to commence the business of life; 4th to 6th, saw it engaged cleaning and brushing itself (within the cocoon); the imago emerged on June 7th, and proved to be a male. The second larva changed to pupa on May 8th, and is without doubt a female, the development of which has been very much retarded by the very cold weather: it is still in pupa, all the limbs are hanging free from the body; at a casual glance it appears like the perfect insect, with the exception of the wings, which are about one-third the proper length, are hanging down by the side, and brought slightly in front of the under side of the abdomen. The insect in the cocoon remains erect, resting on the anal segments of the abdomen, the thorax leaning against the cocoon. The other two larvæ produced *Chrysis ignita.*—G. C. BIGNELL; Stonehouse, Devon, June 21, 1882.

CHRYSIS IGNITA, *L.*—On June 19th I bred this insect from *Odynerus pictus*, from larvæ taken on July 13th, 1881, in the Plymouth cemetery.—ID.

DIPTEROUS LARVÆ IN THE HUMAN SUBJECT.—At one of the meetings of the International Medical Congress, Dr. W. G. Smith stated that a girl, aged twelve, presented herself with the following history:—About three months before being seen by a medical man an ovoid swelling appeared on the outer side of the ankle, causing her some pain and uneasiness in walking. This swelling gradually shifted its position and slowly moved up the leg, thence towards the right axilla, then down to the elbow, and finally settled on the back of the neck. In this position a small dark spot appeared, an orifice formed; and when pressure was made around this opening a white grub, nearly an inch in length, protruded, and escaped along with some unhealthy pus. Several other similar swellings developed upon subsequent occasions under medical observation, and the medical man extracted other grubs, exactly similar to the first specimen. No cause could be assigned for these curious phenomena. The larvæ were pronounced by competent authority to belong to a dipterous insect, although the genus could not be satisfactorily determined. There was no sufficient proof of the existence of an œstrus peculiar to man alone. A good abstract, from which the above is quoted, appeared in the 'British Medical Journal,' October 1st, 1881. I shall feel grateful to any of your readers who will give additional information or references.—WILLIAM E. A. AXON; Fern Bank, Higher Broughton, Manchester.

NOTE ON THE USE OF NAPHTHALINE IN CABINETS FOR THE PROTECTION OF INSECT COLLECTIONS.—In the 'American Naturalist' for May, 1882, p. 409, which Prof. C. V. Riley has most kindly forwarded to me, I find that "Mr. C. A. Blake, of Philadelphia, has been preparing cones of naphthaline run around a pin, so that they may be stuck into a box of insects, and that the naphthaline may permeate the box and last for a considerable time. They are made after a formula recommended by Drs. Le Conte and Horn, and are very convenient to handle. They gave such promise of usefulness that we obtained quite a lot of them, and went to the trouble of supplying all our insect boxes with the same. We have speedily rejected them, however, and give this note of warning, especially to lepidopterists, to whom they will prove particularly objectionable, as our experience of a few weeks suffices to show that they very quickly encourage greasing, and soon produce a relaxed, sordid, or greasy appearance of the insects. Another objection is that by deliquescence the pale chocolate colour of the cones communicates to, and discolours, the lining of the boxes wherever it comes in contact therewith." I am not aware that in England such a preparation of naphthaline is ever used; but the object of my note is to ascertain whether any entomologist, who has used the ordinary white crystalline form of naphthaline as a preservative against mites, has noticed that any ill effects have resulted. I may add that it has been used in my cabinets without any evil results, as far as I can judge.—J. JENNER WEIR.

[We shall have some further remarks to make on this subject in an early number of the 'Entomologist.' So far as our experience goes, after long trial, naphthaline appears by far the best preventive against mites, and even mould, in collections, not only of Lepidoptera, but also any prepared Natural-History specimens, being highly fatal to life of any kind.—ED.]

REVIEWS.

'*Matabele Land, and the Victoria Falls.*' Edited by C. G. OATES, M.A. London: C. Kegan Paul & Co. 1881. Coloured Plates and Maps.

THE work under notice has been apparently published as a monument to one dead, by a surviving brother. The gist of the work consists of a series of letters and memoranda written in uncivilized Africa, by the late Mr. Frank Oates, F.R.G.S. These have been edited by Mr. C. G. Oates with great care and evidently as a labour of love. The work is profusely illustrated, not only with woodcuts, but by chromo-lithographic facsimiles of water-colour drawings taken by the traveller. These latter are very striking, being full of colour, one—that of the Victoria Falls—especially so. Added to these, in the Appendix are the plates (nine of which are coloured), devoted to the natural history portion of the work; four of these concern the readers of the 'Entomologist,' as they illustrate the more remarkable insects found in the collection made by Mr. Oates. There are also four elaborate maps for the reader's guidance and reference.

The editor devotes the first thirty pages to a memoir, which unfortunately but varies the too oft-told story of a young man who leaving home in robust health, on his voyage of scientific and geographical discovery succumbs to fever caused by the worry, fatigue, and privation of African travel. This memoir is rendered more sad by the clever cartoon, drawn by Mr. Charles Whymper, of Frank Oates' favourite pointer dog standing by the graveside of his master. This dog left the camp some eighty miles from the scene of its master's death, and was found by the boys sent in search of it, patiently watching by the grave. We are glad to find the faithful creature was rescued from starvation, and ultimately sent to England. There are also sketches by the same artist on other pages of the work.

The collections made by Mr. Oates were brought to this country, and having been examined were sent to the specialists in each group. The reports of these gentlemen form an important Appendix of some hundred pages. Among the more elaborate of these papers is an able review of the Ornithological work by Mr. R. Bowdler Sharp, F.L.S., and a report by Professor Westwood on the Entomology. This part of the collection, which was made in the south-eastern portion of Mr. Wallace's sub-region of "East Africa," has been added to the Entomological Museum of the University of Oxford. The Lepidoptera seem to have attracted his chief attention, other orders, however, being represented. Professor Westwood refers to seventy-five species of butterflies, several of which he describes and names. To those entomologists studying the geographical distribution of the Rhopalocera, reference should be made to this paper. This is a handsome book, suitable alike for the drawing-room or study.—J. T. C.

Exchange List of British Coleoptera.

This appears without imprint or compiler's name, but, from a private communication, we find it is claimed by Mr. A. E. Hodgson, of Coleford, Gloucester. This omission is unfortunate, for the work of compiling this list is so well done, that it would be rather a credit than otherwise to the compiler if his name were associated with the work. The list is founded upon the lines of the well-known exchange lists of British Lepidoptera, which have undoubtedly contributed more to the popularity of that order than probably anything which has been written upon the subject. We hope, now that coleopterists have the means of circulating handy lists of their desiderata, a great impetus may be given to the number of workers amongst beetles. Mr. Hodgson seems quite up to time, both in his list of recent additions to our Fauna and his arrangements, having separated the families Ptinidæ and Cissidæ from the Malacodermata, with the term Teredilia. The venture is worthy of the success which we hope it will attain.—J. T. C.

NOTES ON CURRENT ENTOMOLOGICAL LITERATURE.

Economic Entomology.—Miss Eleanor A. Ormerod, F.M.S., is not inclined to leave her "insect enemies" much peace. This energetic lady issues one report after another so rapidly, that before long she ought really to stir up her bucolic constituents to some sense of their duty, not only in trying to remedy the insect plagues of their neighbourhood, but also to furnish her with such observations as may help the Royal Agricultural Society's Consulting Entomologist to formulate the life-histories of these insects, and so be better able to suggest remedies for the prevention of their ravages. 'Report of Observations of Injurious Insects for 1881' has been issued, containing 107 pages, with many woodcuts. The turnip-fly, *Phyllotreta nemorum*, occupies a large portion of the report. This subject has also been treated separately, in a "Report" of 51 pages, with woodcuts. How important is the subject may be gathered from the statement that the financial loss varies in different districts from £2 to £5 per acre. The total loss may be roughly estimated when we state, that acreage of turnips and swedes under cultivation were returned on June 4th, 1881, as 1,149,768. These reports are well worthy of examination, and are so inexpensive as to be within the reach of all. Following up this work, Miss Ormerod recently gave another lecture before the Royal Agricultural College, Cirencester, 'On the Turnip Fly.' This is issued in pamphlet form. All these works may be obtained from W. Swan Sonnenschein & Co., London.

Artificial Destruction of Insects.—In 'Smithsonian Report, 1880,' just issued, are some remarks, where the following occurs (p. 253):—"It may be recalled that at the Portland (1873) meeting of the American Association for the Advancement of Science, Dr. Le Conte suggested that an efficient mode of checking the devastations of the insects injurious to agriculture might be the 'production of diseases' from parasitic fungous growths. He mentioned 'an instance in which from the communication of the disease by some silk-worms, the whole of the caterpillars in a nine-acre piece of woods were destroyed.'" Experiments have been made upon various forms, and lately on potato-beetles. Those inoculated with the fungous disease died in from eight to twelve days, while others in the same room, but which were not so treated, lived through the winter. Plant-lice were killed in a hot-house by similar means"

Fossil Entomology.—Mr. S. H. Scudder has compiled 'A Bibliography of Fossil Insects,' which appears as No. 13 of the 'Bibliographical Contributions,' issued in the 'Bulletin' of Harvard University. There are nearly one thousand references, with explanatory notes in most cases. To those who take interest in the insects which occurred in this world before man took to making excursions "with a green net and killing bottle," this compilation will be most useful.

Newspaper Entomology.—That "oldest evening paper," 'The Globe and Traveller,' devoted one of its daily essays (May 20) to "Insect Collectors." The writer has clearly views of his own upon entomologists, but whether they coincide with those of the latter is quite another matter. The entomologists might even go so far as to suggest the essayist should look up his subject a little more carefully before he writes "pot-boilers." In the same paper (May 26) upwards of a column is devoted to an article on insect dealers, founded upon that on 'British Lepidoptera' which recently appeared in these pages (Entom. p. 111). This latter writer seems to know more of the subject, and thereforemakes his subject more interesting.

J. T. C.

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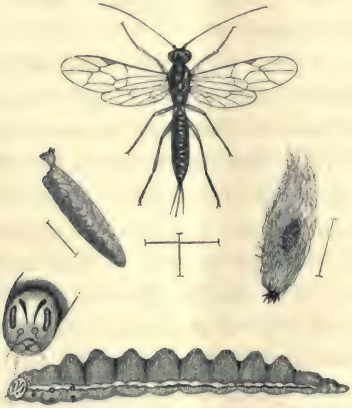
EXTERNAL PARASITES OF SPIDERS.

By Edward A. Fitch, F.L.S.



Polysphincta tuberosa, *Grav.* (female).

More than one hundred years ago De Geer gave us the life-history of an Ichneumon preying externally on a spider. "Cet Ichneumon n'est guères remarquable que par l'endroit où il a vécu sous la forme de larve; mais il l'est beaucoup par cette circonstance" (Mem. pour servir à l'histoire des Insectes, ii., 863-6; pl. 30, figs. 1-3).

In June he found on an alder-leaf a small common spider, on whose body he saw a small white larva engaged in sucking it. After remarking how extraordinary it was that the mother Ichneumon should be able to deposit its eggs on the body of the agile and carnivorous victim spider, he proceeds to give the life-history of the parasite, but says, "J'ai beaucoup de regret d'avoir négligé de prendre le dessein de cette Araignée et de sa larva; je ne crus pas qu'elles auroient à me montrer tant de choses singulieres." He tells us that the spider spun a geometrical web in the box in which it was confined, but soon after he observed that the spider had fallen dead at the bottom of the box, and that the parasitic larva was spinning an elongate white cocoon in the centre of the web. Eight days later a very small Ichneumon emerged from the cocoon; it is described as of about the size of an *Apanteles*, and of no remarkable structure. His diagnosis runs:—*Ichneumon noir à antennes filiformes, à deux rayes jaunâtres sur le corcelet et à pattes jaunes.* Considering the size, this can hardly apply to a *Polysphincta;* but possibly a hyperparasite may have been bred, or possibly this note may lead to the identification of a small black Ichneumon with yellow legs and with two longitudinal yellow marks on the thorax.

Westwood next refers to these external parasites in his masterly 'Introduction' (vol. ii., p. 143). Quoting Dilwynn, he says, "I have frequently observed a small black species [of Ichneumon] successively deposit an egg in the abdomen of two or more spiders on the sand-hills [near Swansea]; and I doubt whether the spider had in any case arrived at its maturity."

John Blackwall, in the course of his researches into the functions and economy of our indigenous spiders, met with their external parasites on several occasions. He bred *Polysphincta carbonator*, Gr., twice in 1838 from *Epeira antriada*, one female on June 27th from the spider taken in April, and one male on August 16th from the spider taken on July 20th. He also tells us that an Ichneumon larva is frequently found attached to the base of the abdomen, or between the abdomen and cephalothorax of *Linyphia minuta* or *L. pusilla*, and that it feeds upon their juices, ultimately occasioning its death. The larvæ were stated to spin silken cocoons, and were most probably those of *Polysphincta* or *Acrodactyla* (Ann. Mag. Nat. Hist., xi., 1; 1843). Blackwall says that only one larva is found on a spider, "which indeed could not supply sufficient nourishment for two"; but Boie on June 14th found two immature specimens of *Epeira diademata*, one of which supported two larvæ of *Polysphincta carbonator*, and the other three; only one, however, on each spider reaching maturity. They spun their cocoons on June 21st, and the Ichneumons emerged on July 1st (Stett. Ent. Zeit., vii., 292).

In June, 1856, Dr. A. Laboulbène found in the middle of a white spider's web, on a dry oak-leaf, three satiny white, dipterous-looking larvæ, and the dead spider (*Clubiona holosericea*, Linné). He suggests that the larvæ had fed on the eggs of the *Clubiona*, doubting whether there was sufficient of the Drassid to nourish the three larvæ. Laboulbène refers to the blackish cloud in the interior of the body of the larva, which "he did not believe" was an internal parasitic larva, but only the alimentary canal; and remarks that, after much hesitation, he was convinced that the feet (pseudopodes) were not upon the ventral, but upon the dorsal surface of the larva. One of these larvæ was killed in examination, but the other two spun oblong cocoons of thin white silk, and in about a fortnight two female Ichneumons emerged (Ann. Soc. Ent. France, 3rd ser., vol. vi., p. 798, pl. 17). Dr. Laboulbène's detailed description of the larva is as follows:—

"Larva elongate, slightly curved (figs. 1-3), composed of thirteen segments, counting the terminal tubercle (mamelon), but not the head. Whitish grey in colour, slightly shining, satiny. The dark alimentary canal shows plainly in its interior (fig. 2), and numerous whitish granulations are observable under the skin. Long 7 mm.

"The ventral region is concave, smooth, apod; the sides of the body are sharply rounded; but the most important point in the structure of this larva is the existence of 'pseudopodes' or false legs situated in the centre of the dorsal or convex region, and to which I shall again refer. Head small, a curvilineal triangle, brownish, appearing to be furnished with two small biarticulate antennæ (fig. 5 *a*), with a rounded, ciliated labrum, and with two mandibles. The parts of the mouth are not easy to distinguish. Thoracical segments largest of all, and rounded laterally and dorsally. Abdominal segments tuberculate? (mamelonnés?) on the sides, the 1st to 7th having in the middle of its back true retractile 'pseudopodes' similar to the false legs of caterpillars, having like them a crown of hooks, which holds them firmly in any position. The two terminal segments (8th and 9th) are trapezoid, forming, with the anal appendage, an inverted cone. There are nine pairs of spiracles; the first situated on the anterior margin of the metathorax; the second upon the 1st abdominal segment (4th of the body of the larva); the third, fourth, fifth, sixth, seventh, eighth, and ninth spiracles upon the 2nd to 8th abdominal segments. A long central trachea traverses the body, emitting a branch to each spiracle; fig. 2 shows their arrangement. The tracheæ are white and silvery over the alimentary canal, but the last as well as those of its corresponding spiracles show black through the transparent body of the larva, under a lens. The surface of the body of the larva is very finely rugulose or covered with very fine wrinkles, which gives it a satiny appearance. I ought to mention the very numerous whitish granulations seen through the skin (fig. 2); similar granulations have been well described by M. Fabre in an interesting work on the Sphegidæ (Ann. Sci. Nat., Zool., 4th ser., vi., 167). He has observed the whitish granular appearance to be due to uric glands, really organs of secretion, in the larva of *Sphex flavipennis* and many others."

Laboulbène then refers to Barthélemy's mention of these granulate uric glands in the larva of *Scenometopia atropivora*, and to the references and figures of Réaumur, Roesel, Bouché, and Goureau, relating to the presence of the "pseudopodes dorsaux" in certain Ichneumonid and Chalcid larvæ. He also says that it is possible that this larva also has lateral tubercles, which he had overlooked in being so much occupied with the prominent dorsal ones, saying that "if they exist, they are not very marked."

A detailed description of the female Ichneumon is given under the name of *Pimpla Fairmairii*. It is said to be very closely allied to *Pimpla rufata*, Gmel., but it is well figured, without an areolet, and is undoubtedly a *Polysphincta;* whether it be a distinct new species is not now under consideration.

In the 'Proceedings' of the Entomological Society of London for January 4th, 1869, we are told that Prof. Westwood exhibited "an Ichneumon and an Epeira, the larva of the former being an external parasite on the body of the spider" (Trans. Ent. Soc. Lond., 1868, p. l). But this is just so much information that only makes us 'long for more.'

In the spring of 1869 Snellen van Vollenhoven received from Herr Ritsema an immature specimen of *Miranda* (*Epeira*) *cucurbitina*, on which a parasitic larva was feeding. The spider spun a web on the following day, and the Ichneumonid larva continued to grow rapidly during the next three or four days, when it spun a cocoon, the skin of the dead spider dropping down. Twelve days after the completion of the cocoon a male *Polysphincta carbonator*, Grav., emerged (Tijd. v. Ent., 2nd ser., vol. v., pp. 17—19; 1870).

On July 25th, 1876, Herr C. G. A. Brischke's wife was fortunate enough to find, about three miles from Danzig, a

Theridion which carried a maggot on the back of its abdomen. This larva was then about three millimetres long, but by the next day it had doubled in size and was shining white, with red spots, the victim spider lying dead on the earth; the larva then gradually became whiter in colour, and on the 27th spun a thin, transparent, white, oblong cocoon, and later turned to a yellowish pupa therein. On August 9th—only fourteen days after the death of the spider—a male *Polysphincta boops*, Tschek,, emerged (Deutsche Ent. Zeit., xxi., 285).

In 'The Fauna of Devon: Ichneumonidæ" (Trans. Devons. Ass. Advanc. Science, &c., 1881) Mr. Edward Parfitt tells us that he had bred *Acrodactyla degener*, Haliday, from "a reddish larva, found feeding on a small spider. The body of the spider was not large enough to contain the larva, so that part of it was exposed. The spider lived until the larva was ready to undergo its change into pupa. It then spun a cocoon, fusiform and angular, attached at both ends to the glass cover of the box after the manner of a hammock. It remained in pupa about a fortnight, and came out September 19th, 1874" (*l. c.*, pp. 41, 42).

Ichneumon parasites of spiders' eggs are numerous, and many species have been bred from various spiders' nests, especially from the elegant little nests of *Agelena brunnea;* but it is not to these I now allude; it is to the interesting cases of external parasitism on the adult spiders. Notwithstanding all the above-mentioned published information, very little appears to be generally known on the subject; I am therefore glad to be in the position to bring forward two more instances from well known observers, and to be able to give a good figure of a *Polysphincta* larva from a drawing made by Mr. G. C. Bignell. The species of the genus *Polysphincta* and Haliday's closely allied *Acrodactyla* all appear to be rare in Britain. They are probably exclusively spider vampires, as Boie terms it, although Brischke gives *P. carbonator* as bred from a sawfly (*Nematus ventricosus*), but this is probably an error; both *P. rufipes* and *P. boops* he gives as bred from *Epeira diademata.* Ratzeburg gives many hosts, but the information and determination is somewhat doubtful.

The Rev. A. Matthews, of Gumley, thus writes:—"On July 4th, 1874, my brother, the Rev. H. Matthews, found a spider with a white maggot-shaped larvå lying across its back, between the thorax and abdomen, firmly attached by each extremity of its body to the under side of the spider's thorax, between the articulations of the legs He brought them immediately to me, and we placed them in a dry phial-bottle, with a few Aphides for food, and tied a piece of muslin over its mouth. The spider soon made a web in which the Aphides became entangled, and thus they remained for the rest of the day without any material change, except that at one time the larva had nearly emptied the body of the spider, and had himself become green; but this was only a temporary change, for shortly after he resumed his original opaque-white hue. On the following morning he had spun himself up in a long narrow orange cocoon, attached to the web of the spider, and had changed into a pupa; while all that remained of his unfortunate companion was a shrivelled skin lying at the bottom of the bottle. On July 14th the imago emerged from the cocoon in the shape of the Ichneumon which I now send, together with the aforesaid cocoon and the mortal remains of the spider. I am unacquainted with spiders, but suppose this species to have belonged to the *Epeiridæ;* its head and thorax were pale yellow, with pink shading, and its abdomen brilliant pea-green." The Ichneumon is nearest to *Polysphincta pallipes*, Holmgr., but does not exactly agree with Holmgren's description of that species; whether it is a variety of this or a new species must be left for further consideration. Its oat-shaped cocoon, which is ochreous in colour and quite opaque, is figured to the left in the woodcut. The spider is probably *Epeira cucurbitina*, Clerck.

Mr. G. C. Bignell, of Stonehouse, writes:—"*Polysphincta tuberosa*, Grav., bred from a greenish coloured spider beaten out of oak on the 22nd May, 1882: it is an external parasite, and the larva is too curious a looking little fellow to be allowed to pass unnoticed. When the spider was first beaten out, I asked the gentleman who saw it what it looked like; he replied, 'It is very much like a miller's man carrying a sack of flour'; to which I quite agreed, for it was laying sack-like across its back; it was full fed by the 24th. On the 23rd I had a good look at it, and made a sketch; it had no legs, but in place of them it had sucking-discs, two on the 2nd segment and four on the 3rd and 4th, six of them occupying the usual place of the legs; the other four were half covered with the skin-fold usually seen on lepidopterous larvæ; on its back it had eight tubercles, the first on the 4th, the others on the seven following segments; each tubercle was surmounted with two rings of hooklets, with three or four in the centre. The object of these was to suspend itself by the web while feeding on the last remains of its victim, and holding on after it was consumed; when the whole of the spider's body had been extracted, the legs and empty skin were allowed to fall down. The larva then commenced to make itself a cocoon, which was finished by the third day; it was during this time the tubercles had to play such a prominent part, having to perform the work of the claspers of an ordinary caterpillar; when a tentacle attached to the silken cord had to be removed, it was done by withdrawing the hooklets into the tentacle, when it at once became disengaged and ready to make another 'attachment.' From one spiracular line to the other were rows of black dots, two on the 2nd segment and one on the remainder; the centre of each was occupied by a short hair. The anal segment often had a very important part to perform, by being brought round to the assistance of the mouth; I first observed this while it was feeding, to disengage some internal portion of the spider from its jaws; afterwards it was frequently used to attach the silk to some part of the cocoon when the blunt round head of the larva appeared not to be able to attach the silk to its satisfaction. When full fed the larva was about three-eighths of an inch in length. I have no hesitation in saying that this larva had fourteen segments (counting the head as one). Cocoon shuttle-shaped, whitish, and thin; the movements of the larva and pupa were perceptible through the thin cocoon. The perfect insect appeared on the 12th June."

Mr. Matthews' account of the larva changing colour before and after a meal is confirmatory of what Brischke says; and Mr. Bignell's express statement that the larva has fourteen segments is confirmatory of Laboulbène's description. Mr. J. B. Bridgman has seen and named both species, and, referring to *P. tuberosa*, writes, "I have the same species, given to me by Mr. F. Norgate, with the cocoon and spider-skin exactly like Mr. Bignell's."

The woodcut represents *Polysphincta tuberosa*, Grav., female, with its thin white cocoon on the right, to the extremity of which is attached a curious small black tassel of excrement. The larva (from Mr. Bignell's drawing) is represented below, with an enlarged figure of the head. The thick ochreous cocoon on the left is that of Mr. Matthews' species (*Polysphincta pallipes*, Holmgr. ?).

Maldon, Essex, July, 1882.

NATURAL LOCALITIES OF BRITISH COLEOPTERA.

By Rev. W. W. Fowler, M.A., F.L.S.

No. VI.—EDGES OF PONDS—FENS AND MARSHES.

The edges of ponds often abound with Coleoptera; many of them belong to the same genera as those taken on the banks of rivers, but the species are usually different. Large reservoirs with gravelly banks often afford a favourite habitat for many *Bembidia*. Dr. Power twice took *B. obliquum* abundantly in such a locality. The shores of lakes also produce some good species, as for instance *Cryptohypnus maritimus*, which is found on the shores of Loch Rannoch; *B. bipunctatum* and *doris* are also found in like localities. We have now, however, to deal with ponds in the ordinary acceptation of the word, as we find them scattered everywhere throughout the country: the banks of the small ponds in open fields will produce very few species, and those of the commonest kinds, but a pond in a wood, or, better still, on the edge of a wood, only half surrounded by trees, and with a south or west aspect, will afford very numerous species, especially if the edges are rather swampy, and rushes grow round it. Many things may be found upon these, or running on the ground at their roots, but if they are mowed down and left to decay, the *débris* will be found to be very profitable. On the edge of such a pond near Repton, I found *Bembidium bruxellense* in abundance, and other *Bembidia*, three species of *Bradycellus*, *Trechus rubens*, a number of Staphylinidæ, and several very good Trichopterygidæ, including *T. cantiana* and *T. lætitia*. In a like locality near Lincoln I have lately obtained *Choleva spadicea*, *Anchomenus oblongus*, and other species. It is a very good plan to shake the rushes and rubbish over a sieve and collect the residue in a bag; this will be found well worth examining at home: from a small bag of such shakings sent me by post by Mr. W. G. Blatch, from a pond near Coleshill, I once obtained *Bryaxis impressa* in some numbers, *Evæsthetus ruficapillus* abundantly, *Ocyusa maura*, *Mycetoporus longicornis*, *Psammæchus*, and others.

Very good Staphylinidæ are to be found on the edges of ponds and on marshy ground, such as *Stenus major*, *S. proditor*, and other *Steni*, *Gymnusa brevicollis* and *variegata*, *Myllæna elongata*, *Tachyusæ*, *Deleaster*, and good species of *Philonthus* and *Homalota;* the very rare *Acrognathus mandibularis* is found near London amidst the rotten leaves on the very edge of stagnant ponds, half in and half out of the water.

On a warm day many good species will be found on plants growing out of the water; if these be struck sharply the insects will fall into the water, and may be picked out at leisure. The rare *Oxytelus fulvipes* has been taken in some numbers in this way in Needwood Forest, near Burton-on-Trent; *Galerucæ*, *Phytobii*, *Bagoi*, and others may also be obtained in the same way, although the latter and also *Phytobius leucogaster* are to be found in greater abundance by pulling up the plants bodily and shaking them over a sheet, as the beetles live submerged for a long time.

The stems of *Typha latifolia*, especially in winter, contain numerous species: in company with Mr. Blatch, who kindly shewed me the locality, I found *Baris T-album*, *Anchomenus puellus*, and others in Sutton Park, near Birmingham, and he has himself taken other much better species in the same place.

One of the most favourite localities with the London collectors is, or rather used to be, Hammersmith marshes: very rare beetles have been found there in some numbers. We must however pass on now to the consideration of the fen districts proper, which come in naturally in this connection.

Entomologists know well what a number of peculiar species of Lepidoptera the fens produce, and the Coleoptera are quite as peculiar, and will well repay any collector who may work them: the only Coleopterist who ever did very much work in the fens was Mr. Crotch, and I am indebted for many hints in this paper to Mr. Matthews, who once or twice accompanied Mr. Crotch in his expeditions.

We may divide the fen districts into three, the Lincolnshire fens, the Norfolk fens, and the Cambridgeshire fens: the former of these has been so much drained that it is the least profitable of the three, and it is the last that is the most productive, although a great number of good species occur in Norfolk in the neighbourhood of the well-known Broads.

In the fen districts it is customary to cut the sedge and reeds in large quantities, and carry it up the rivers in sedge boats, as they are called; if a collector will furnish himself with a sheet, and persuade the boatmen, which only requires a small fee, to shake the bundles over it as they unload them, he will reap a rich harvest,—*Odacantha melanura* in abundance, *Dromius longiceps* and *sigma*, and *Aetophorus imperialis* being some of the best species; these of course may all be found in their respective homes, but this is a very good way of obtaining them. The bundles must not be fresh cut, but must have lain some little time.

The smaller beetles that may be obtained in this way are legion. *Atomariæ* for instance, such as *A. gutta*, may be found by thousands; many *Atomariæ* seem to be fond of marshy places; thus *A. Barani* was found some time ago in a marshy place near Eltham, and I have swept *A. basalis* in numbers on low swampy ground near Repton.

Very good Trichopterygidæ occur in the fens, and very probably new ones would reward any collector who paid attention to them; at any rate exceedingly scarce species like *T. Kirbyi* and *T. Championis*, *Ptilium cæsium* and *affine* might be found in some numbers.

The Steni of the fens are very good. *S. palustris* may be obtained in large quantities by sweeping at Wicken Fen, and *S. opticus* at Horning Fen. *S. vafellus* and *S. fuscipes* also occur plentifully, and *S. argus* sparingly; *S. lustrator*, *S. proditor*, and others may also be found; other good Staphylinidæ, such as *Thinobius brevipennis*, *Lathrobium rufipenne* and *angustatum*, *Platystethus nodifrons*, *Micropeplus tesserula*, &c., may be obtained, and the pretty little *Hypocyptus discoidens* may be taken in thousands by shaking refuse and rushes as above described. *Euplectus ambiguus* may be captured by sweeping rushes on a hot day. *Chrysomela graminis* is extremely abundant at times, and occasionally *Phyllobrotica quadrimaculata*, and the very rare *Adimonia œlandica*, Boh. (*villæ*, W. C.) may be found in numbers. *Silis ruficollis* is a fen insect well worth looking out for with these. *Malachius ruficollis* sometimes occurs plentifully, and *Chrysomela gœttingensis* sparingly. *Hæmonia Curtisi* is also to be found.

Certain good Longicorns seem peculiar to the fens and fenny districts, as *Oberea oculata* and *Saperda carcharias*: the latter occurs near Lincoln. *Agapanthia lineatocollis* may be found not uncommonly on thistles.

Besides the *Dromii*, &c., above mentioned, the fens contain very many good *Carabidæ*, which may be found under refuse on the edges of ponds or in damp places; the Lincolnshire fens near Boston have produced *Badister peltatus* in quantities; the rare *Pterostichus aterrimus* and *P. anthracinus* are almost peculiar to the fens, and with *P. gracilis* and *P. minor* may be taken on Whittlesea Mere. *Blethisa multipunctata* and *Oodes helopiodes* are very seldom captured out of the fen districts; they have, however, been found at Askham Bog, near York. There are also other good insects which frequent the fens, but which are also found in other localities, and cannot therefore be called true fen insects, such as *Dyschirius æneus*, *Anchomenus oblongus*, *Elaphrus uliginosus*, *Amara consularis* (recorded by Mr. Dawson as abundant in Holme Fen, Huntingdonshire), *Panagæus crux-minor*, *Stenolophus Teutonus*, *Skrimshiranus*, *vespertinus*, and *dorsalis*, *Bradycellus placidus*, *Bembidium assimile*, and others. Several specimens of the very rare *Chlænius holosericeus* are said to have been taken near Whittlesea Mere in 1826, but I do not know whether the locality has since yielded a specimen.* We must not forget to mention *Trechus rivularis*, Gyll. (*incilis*, Daws.), which is so great a desideratum with all collectors. Mr. Dawson took two specimens at Whittlesea, and a labouring man found sixteen in the fens between Holme and Yaxley; it may therefore again turn up, but is very probably extinct in the latter locality, as almost the whole of the ground on which it was found was brought under cultivation about five-and-twenty years ago according to Mr. Dawson's notice of its capture.

We might suppose that the Curculionidæ would not be so well represented, but, as we might expect, several species of *Bagous*, *Grypidius equiseti* and others occur; there would probably be many species of *Phytobius* also; *Lixus paraplecticus*, which now appears to be becoming extinct, used to be found in some numbers.

I had intended to say a few words on salt-marshes and salterns, but I must defer them to the next paper.

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* It occurred in Burwell Fen and the neighbourhood in 1832, where Dr. Power took eight or ten specimens.—J. A. P.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

By John B. Bridgman and Edward A. Fitch.

No. III.—CRYPTIDÆ.

The Cryptidæ include those *Ichneumones pentagoni* with a distinct lateral sulcus to the mesosternum, with few exceptions an exserted aculeus in the female, and with the spiracles of the first abdominal segment generally farther from its apex than from one another. Certain males might easily be mistaken for *Ichneumones pneustici*, but the females are at once distinguishable by their exserted ovipositor, except in *Stilpnus*.

Gravenhorst (Ich. Europ., vol. ii.; 1829) included the genera *Hoplismenus*, *Cryptus*, *Phygadeuon*, *Mesostenus*, *Baryceros*, *Hemiteles*, *Pezomachus*, *Phytodictus*, *Ischnoceros*, *Nematopodius*, *Mesochorus*, and *Plectiscus* in this family. *Hoplismenus* has already been included in the *Ichn. oxypygi; Baryceros* included a single South-American species; *Phytodictus*, and *Ischnoceros* are now included in the Pimplidæ, and *Mesochorus* and *Plectiscus* in the Ophionidæ. *Stilpnus* was included in the Ichneumonidæ by Gravenhorst; it unites the two families. Foerster, in his admirable 'Monographie der Gattung Pezomachus' (Berlin, 1851), makes seven new genera, besides *Pezomachus; Pterocormus*, a new genus made by Foerster for Gravenhorst's *Brachypterus*, is included, but this was founded on a single species (*B. means*, Gr.), since proved by Marshall to be the short-winged variety of *Ichneumon latrator*, which has already been referred to. Taschenberg ('Die Schlupfwespenfamilie Cryptides,' Zeits. Ges. Nat., vol. xxv., pp. 1—142; 1865) included the genus *Exolytus* amongst the Cryptidæ, but Holmgren has removed it to the Ophionidæ, and Brischke has taken the same view. Foerster made *Exolytus*, *Atractodes* and *Stilpnus* into a separate family, Stilpnoidæ: these three genera all have more or less complete pentagonal areolets and aculeus not or hardly exserted, thus having some resemblance both with the Ichneumonidæ and Cryptidæ; *Stilpnus* has an oval abdomen, whilst in *Exolytus* and *Atractodes* it is elongate, and in the latter genus is subcompressed. Taschenberg also included *Ischnoceros* and *Agriotypus*, and added *Linoceras*, *Brachycentrus* and *Orthopelma* as new genera. In Tschek's monograph of the Austrian Cryptidæ (Verh. z.-b. Gesell. Wien., vol. xx., pp. 109—

156, 403—430; xxii., pp. 231—252) many new species are described, but only one new genus, *Listrognathus.* Thomson (Opusc. Entom., fasc. v., pp. 455—527) divided the typical Cryptidæ into four tribes,—the *Cryptina*, *Phygadeuonina*, *Hemitelina*, and *Stilpnina.* The *Cryptina* are further subdivided into three sections, which include fourteen genera, eleven of which are new; the *Phygadeuonina* are divided into two sections and three subsections, which also include fourteen genera, all of which are new, except *Phygadeuon.* As these divisions and genera have not been generally adopted we shall not further refer to them.

In order to make the determination of species as simple as possible, we have adopted the broad generic divisions of Taschenberg and Foerster, with the necessary alterations and additions. The characters used in the table of species are those mainly referred to by Taschenberg, viz.:—the shape of the metathoracic spiracles, which are situated in the upper side of the metathorax, rather nearer to the scutellum than to the abdomen (see Entom. xiii., pl. i., figs. 2, 3 *a*, 3 *d*, 3 *e*); the completeness or incompleteness of the metathoracic areæ, which, when complete, consists of a superomedial area, and two lateral areas on each side (*l. c.*, fig. 2); sometimes the division between the middle and side areas is wanting, sometimes the upper or lower dividing line of the superomedial area, and sometimes the divisions between the lateral areæ. After these simple structural characters we have divided them into groups according to colour, but, as before, we must point out that colour is always variable and unsatisfactory.

Foerster's characters for the *Pezomachi* are as follows:—He first divides them into two large divisions, according to the presence or absence of a curved raised line dividing the upper part of the metathorax from the back or slanting part; this line is often more or less indistinct in the middle: he then subdivides them into those which have the hairs, and the pits in which they are placed, either dense or scattered; the length of the aculeus or ovipositor; the comparative lengths of the third, fourth and seventh joints of the antennæ. Generally speaking the scutellum is wanting in the genus *Pezomachus*, but in some species it is very indistinctly defined.

Ratzeburg ('Die Ichneumonen,' vol. iii., p. 157; 1852) formed the subgenus *Hemimachus* for those male *Hemiteles* which had the metathoracic areæ indistinctly defined; he included seven species, all bred from the cases of *Psychidæ*. Subsequent observations have proved that these species are only the winged males of certain apterous female *Pezomachi*, and we have no doubt but that further experience will show that most of the *Pezomachi* have winged partners; but this question will be more especially referred to under the respective genera. Wesmael first expressed the opinion that the winged males of the apterous female *Pezomachi* were to be found in *Phygadeuon* or *Hemiteles*. Foerster rather doubted this; but Ratzeburg's and subsequent observations on bred specimens go to prove its truth. The Cryptidæ are well illustrated by four plates in Vollenhoven's 'Pinacographia.'

The great value of bred specimens is well illustrated in this family; without their aid it is almost impossible to unite the two sexes of a species, and until both have been bred together we shall be unable to form a satisfactory table of genera. Taschenberg (*l. c.*) describes 96 species of *Phygadeuon*, only 18 of which are known in both sexes; 98 species of *Cryptus*, only 17 of which are known in both sexes; and 56 species of *Hemiteles*, only 14 of which are known in both sexes. Foerster described 189 female and 44 male *Pezomachi*, the sexes of one species only—the doubtfully British *Catalytus fulveolatus*—being described, and in this he follows Gravenhorst. Experience has shown that even this small number of mated species are not all legally married. Curtis says of *Hemiteles melanarius* and its female (*vicinus*), bred from *Pieris napi* pupa, "the female differs so materially that no one would suppose it was the legitimate partner of the foregoing male" ('Farm Insects,' p. 102). The sexes are just as dissimilar throughout the family, and we know that some species (*Phygadeuon fumator* and *Cryptus migrator*) have subapterous forms; also that the apterous female *Pezomachus rufulus*, has a fully-winged and subapterous male: these anomalies may be general. The genus *Hemiteles* is in a more unsatisfactory state than any other of this family. Foerster, in the 'Synopsis,' divides his family, *Hemiteloidæ*, into 72 genera, and this includes *Catalytus* and *Orthopelma*; whilst Gravenhorst, Ratzeburg and Taschenberg together describe just over 80 species.

Kirchner includes 642 species amongst the Cryptidæ in his unsynonymic 'Catalogus Hymenopterum Europæ'; Dours gives 57 species only as occurring in France; Marshall includes 257 species in his 1872 Catalogue, and several have been added since, as will be seen. Kirchner and Dours include *Agriotypus.*

Ratzeburg mentions the Cryptidæ as parasitic on five orders of insects,—the Coleoptera, Lepidoptera, Hymenoptera, Diptera, and Neuroptera,—and subsequent scattered observations confirm this diverse parasitism, as will be seen when the genera are treated in detail. We also know that several species of *Pezomachi* and *Hemiteles* have been bred from spider's eggs, and both these genera are commonly hyperparasitic on other Ichneumonidæ and Braconidæ; probably this is also their *rôle* when so especially attached to the case-bearing Lepidoptera (*Psychidæ, Coleophoræ,* &c.). The species are mostly gregarious in their parasitism, several being bred from one host, and the sexes are always very unequally developed,—all males or all females being bred, or never hardly more equally than within ten per cent. of one another; thus one male or female to ten females or males, as the case may be. Most of the species spin their gold-beater's-skin-like cocoons generally within the cocoon or case of their victim, when lepidopterous; they appear to be especially attached to the case-bearing or cocoon-making species. Westwood says, "In a species of *Cryptus,* of which I have observed the transformations, the cocoon is long, cylindric, and rounded at each end; and I distinctly noticed that it was composed of three separate layers, the two interior being very shining, and of a gummy membranous texture, and each of them formed of a distinct elongated cap at each end of the cocoon." Mr. Mink notices a jumping hymenopterous pupa, belonging to a species of *Cryptus* (Tijd. v. Ent. xv. 285).

Unlike the Ichneumonidæ, the Cryptidæ are not sun- or flower-loving insects, but they are generally found at the roots of low plants, or amongst dead leaves and *débris* in dry ditches, or at the roots of old trees, running or skipping about, with their antennæ rapidly vibrating; they seem very partial to clumps of tansy, and are frequently found on nettle, mint, or other leaves when covered with honey-dew; a few of the larger species, as *Cryptus tarsoleucus, C. assertorius, C. analis, C. peregrinator,* and *Phygadeuon jucundus,* &c., are, however, to be found on the blooms of *Pastinaca, Angelica,* and other Umbelliferæ. Many of the females, and all the *Pezomachi,* appear to hybernate, as they are frequently found, under moss and loose bark low down, from autumn to spring. Throughout the year more species of Cryptidæ may be captured with a coleopterist's sweeping-net, and a systematic examination of loose *débris*, than by any other means we know of; with the exception of a few common species of *Hemiteles* they are seldom seen on the wing. The very common female of *H. aerator* is frequently found running briskly upon the inside of our windows, while its bright-coloured male is seldom seen unless bred; any special habits, &c., will however, be noted in fuller detail under the various genera. It is not of great consequence whether the Cryptidæ are pinned or carded, as most of the characters are taken from the upper side; the apterous *Pezomachi* are certainly to be carded for preference.

The following is the table of genera, following Marshall's catalogue, for the most part translated from Taschenberg and Foerster:—

A. Wings normally developed.
a. Aculeus hardly projecting.
Abdomen almost round and shining. - Gen. 1. *Stilpnus*, Grav.
b. Aculeus distinctly projecting.
* Areolet completely closed.
† Areolet pentagonal (almost quadrate or triangular).
: Apical joints of the antennæ of the female somewhat nodose.
§ Antennæ of the female filiform, the 3rd joint at the most twice as long as thick, or the entire antennæ between the middle and the apex thickened; if slender, then the metathorax with areæ. In the male the post-petiole is distinctly broader than the petiole and geniculated. - - - - Gen. 2. *Phygadeuon*, Grav.
§§ Antennæ of female elongate, filiform, never thickened in the middle, the 3rd joint generally three times, or more, longer than thick; if less, then the metathorax is without areæ. Post-petiole of the male not much wider than the petiole and slightly curved, consequently the 1st segment of the abdomen is slender.
Gen. 3. *Cryptus*, Fabr.
:: Apical joints of the antennæ of the female not thickened, cylindrical throughout.
× 1st abdominal segment, in both sexes, elongate; post-petiole hardly wider than the petiole, polished. Metathorax with two transverse lines, spiracles of metathorax linear. - Gen. 4. *Linoceras*, Tasch.
× × 1st abdominal segment of the female very short, almost sessile. Metathorax with only one transverse line which is angled, spiracles small and circular. Areolet very small.
Gen. 5. *Cyrtocryptus*, Marsh. = *Brachycentrus*, Tasch.
†† Areolet quadrate or right-angled, proportionately very small.
o Metathorax rough, with two transverse lines and elongated spiracles. Insect not unusually slender. - - Gen. 6. *Mesostenus*, Grav.

oo Metathorax smooth, only the front transverse line present, with small circular spiracles. Insect very slender.
Gen. 7. *Nematopodius*, Grav.

** Areolet of wings pentagonal in shape, but, in consequence of the absence of the outer nervure, not complete.

-+- Abdomen petiolated or subpetiolated.

++ Metathorax with areæ. - - - Gen. 8. *Hemiteles*, Grav.

++++ Metathorax without areæ (males). Gen. 17. *Hemimachus*, Ratz.

-+--+- Abdomen subsessile. - - - - - *Cecidonomus*, Bridgm.

*** Areolet of wings not present; if incompletely formed not pentagonal.

∽ Petiole of abdomen linear, aciculate, its spiracles placed before the middle. - - - - - - Gen. 9. *Orthopelma*, Tasch.

∽∽ Petiole widened at the apex, its spiracles placed behind the middle.
Gen. 10. *Catalytus*, Foerst.

B. Wings abbreviated or entirely wanting.

a. Rudimentary wings present.

* Aculeus very short; either scarcely projecting or not half as long as the 1st abdominal segment. - - Gen. 11. *Cremnodes*, Foerst.

** Aculeus elongated; generally more than half the length of the 1st segment.

† Metathorax furnished with complete and regular areæ; 2nd and 3rd abdominal segments abnormally long. Gen. 12. *Stibeutes*, Foerst.

†† Metathorax generally without areæ, or these incomplete; 2nd and 3rd segments not abnormally long.

‡ Scutellum distinct.

§ Penultimate joint of the hind tarsi bilobed.
Gen. 13. *Agrothereutes*, Foerst.

§§ Penultimate joint of the hind tarsi not bilobed.

× The rudimentary wings extending beyond the base of the metathorax; 1st abdominal segment punctured.

o Antennæ bi- or tri-coloured. - - Gen. 14. *Aptesis*, Foerst.

oo Antennæ unicolorous. - - - Gen. 15. *Oresbius*, Marsh.

× × Rudimentary wings not reaching the base of the metathorax; 1st abdominal segment more or less aciculate.
Gen. 16. *Theroscopus*, Foerst.

b. Apterous.

‡‡ Scutellum not present, or at the most very indistinct.
Gen. 18. *Pezomachus*, Grav.

NOTES ON THE SEASON.

By Richard South.

On every hand I hear complaints of the season from lepidopterists and others. The tale told by Mr. Prest, of York (Entom. xv. 162), is echoed by an entomologist working from the Kentish coast, and is quite in accord with my own experience in North Devon (Entom. xv. 153), and lately in Norfolk and Suffolk.

I hope we shall have notes from all parts of the country, and that at the end of the season these may be collated and commented on by one of our many scientific entomologists. In connection with this I would suggest the desirability of some organised system of records from various parts of Great Britain. If an entomologist in each of the chief centres would take upon himself the trouble of collecting the result of the observations of his *confrères* in the district, and embody such in a monthly report to the 'Entomologist,' he would, I submit, do much towards the advancement of the science. Beginners in the study often have interesting facts come under their observation, but, thinking such have been observed before, fail to take other than passing note of the occurrence. Again, are not the observations of experienced collectors, either from lack of time or inclination,—perhaps more often from a feeling of diffidence,—lost to the bulk of entomologists? I am not aware of any entomological society in England supporting an organ of its own, nor do I find that such societies contribute much to the literature of the science. There must be often papers read or observations made at the weekly, bi-monthly, or monthly meetings of one or other of the numerous entomological societies throughout the kingdom, which would doubtlessly be perused with interest by entomologists at large if such papers were published in an entomological journal. I do not advocate the sending in for publication simply lists of captures from well-known localities; but where an entomologist finds himself on new, or comparatively new, ground, some account of its insect fauna cannot fail to be of interest, more especially if a short note of habits, &c., is added to particular species.

As I have just alluded to my experience in Norfolk and Suffolk, perhaps it may be as well to give a synopsis of my entomological work in these counties from the end of June to the middle of July of the present year. Of the Diurni I only saw five species, vix., *Pieris brassicæ*, *Vanessa urticæ*, *Satyrus Janira*, *Cœnonympha Pamphilus*, and *Polyommatus Phlæas*; and of these only *C. Pamphilus* was observed in any number, but did not appear to be nearly so frequently met with as in ordinary seasons.

A few of the commoner species of Nocturni were met with, but all were decidedly scarce, with the exception of *Euchelia jacobeæ*; the larvæ of this species were in absolute profusion. I never remember seeing this larva so early in the year before, but have often met with it in August, and one year (1879) as late as September. This year, during the period mentioned, not only were the larvæ to be seen in all stages of growth from recently hatched to full fed, but imagines were flitting about in various grades of condition; some of them indeed were beautifully fresh.

Among the Geometræ a single example of *Lithostege griseata* was the only capture worthy of record; a few other common species occurred, but none in any quantity.

Although sugar was liberally used, and several natural attractions, such as honey-dew, rush-flowers, &c., were examined, only twelve species of Noctuæ were observed, in addition to a few specimens of *Hecatera serena* at rest by day on flowers of viper's bugloss (*Echium vulgare*), and four examples of *Acrophila sulphuralis* netted as they were flying in the sunshine; the last *A. sulphuralis* was a female, which I kept alive in the hope of obtaining eggs; on the third day after capture she deposited one egg, but died on the fifth day with further addition.

Two specimens of *Aventia flexula* were taken off a fence, and of the Pyralides only eight species were obtained, the best of which was *Spilodes cinctalis*. Representatives of the Crambites amounted to seventeen species, including *Platytes cerussellus*, of which species the small number of females captured was out of all proportion to the large number of males captured or observed. *Anerastia lotella* not scarce. *Homœosoma binævella* a few examples, and one specimen of *Phycis abietella.*

12, Abbey Gardens, St. John's Wood, N.W., July 26, 1882.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

VANESSA ANTIOPA NEAR HAMPSTEAD.—In August, 1881, a specimen of *Vanessa Antiopa* was caught at the village of North End, Hampstead; a village boy brought it to my house. As North End is only five miles from Charing Cross, I think it is worthy of notice.—J. W. PHILLIPS; Percy House, North End, Hampstead, July 8, 1882.

APATURA IRIS AT BRENTWOOD.—When at Brentwood, on the 1st inst., I observed two splendid specimens of *Apatura Iris* flying round the tops of some tall oaks. We watched them for more than ten minutes, but were unable to capture either.—W. J. V. VANDENBERGH; July 6, 1882.

Apatura Iris in Sussex.—I captured with the net, on the morning of the 24th inst., outside a wood close to this place, a female specimen of *Apatura Iris*, and in the afternoon of the same day secured a male at the same spot; the former was in good condition, but the latter rather dilapidated. On a previous day I had missed a specimen in the same locality, owing to a strong wind blowing at the time.—H. T. Hutchinson; East Marden Rectory, Chichester, July, 1882.

Singular Habit of Apatura Iris. — It seems to be the invariable habit of *Apatura Iris*, upon first emerging from the chrysalis, to cling to the empty case with the head uppermost for five or six hours; and then reverse the position, and still clinging to the puparium, remain with head down and wings upward for a similar time. For the first attitude it is easy to account, as the wings could not well be developed in any other way; but why the insect should turn round and continue so long in the second posture I cannot understand. I should be glad to have the opinions of others, as well as observations in respect to other species upon their emergence holding, or not, to the pupa-case at all. Some *Argynnis Adippe* that I have been breeding, kindly sent by my friend Mr. Buckell, of Romsey, so far as I could see, passed from the chrysalis at once to to the top or side of the breeding-cage, to allow for the falling down and expansion of the wings, and this perhaps is the prevailing custom; the reversed position on the pupa-ruins being seemingly confined to "their Imperial Majesties" alone.—Joseph Anderson, jun.; Chichester.

The Three British Species of Procris taken on the same Hill.—Cliff Hill, at the foot of which the town of Lewes is situated, is a chalk hill quite isolated from the rest of the South Downs, by the river and town on the west, by brook-lands in the south and east, and by the Weald of Sussex on the north; it is nearly circular, and has a diameter of between two and three miles. In the number of species of Lepidoptera, many rare, it is, so far as I know, unequalled by any other part of the South Downs with which I am acquainted. Last year *Agrotis cinerea* was taken in some numbers, and this year a few were captured; I was fortunate enough to take a fine female. The southern slopes of this hill are the head-quarters in England of *Trigonophora empyrea; Aporophyla australis* is often found on the hill, and each year new surprises greet the careful observer.

For instance, I, who have known the district well for nearly fifty years, never heard of *Papilio Machaon* or *Euchelia jacobeæ* being seen there by any one but myself, nor have I ever seen the latter species there until this June. The object of this note, however, is the genus *Procris*; and it was on Cliff Hill on June 15th, 1845, in company with my good friend Samuel Stevens, I first took these insects. My uncle, the late Mr. Auckland, had taken it the year before; and those two specimens I had exhibited at the Entomological Society, and set at rest the question as to its being an indigenous insect. How well I recollect the joy of James Francis Stephens at this addition to our entomological fauna; a note on this subject will be found in 'The Zoologist' of 1845, pp. 1084-5 On Cliff Hill, wherever *Poterium Sanguisorba* grows in abundance there *Procris globulariæ* may be found, in the second week in June, in perfect condition; this year, as the spring had been warm, it was somewhat earlier, but as cold weather supervened it continued to appear until nearly the end of the month. So far as my observation goes, *Helianthemum vulgare* grows on the hill only on the sunny slope of the northern side of the Coombe; here the plant, although in profusion, is stunted in growth, but extends over a few acres of ground; and about the third week in June the entomologist may be certain on a fine day to find *Procris geryon* in some numbers, and this is the only spot on which it can be found on the hill, so far as I am aware. I may here remark that, although *Helianthemum vulgare* grows on the Rest Hill in far greater luxuriance, I have not discovered *Procris geryon* there, although carefully sought for; nor am I aware that any other naturalist has been more successful. In the lower parts of the hill-valleys the soil, by disintegration, has become deeper, richer, and moister; here *Rumex acetosa* grows, and amongst these plants I found *Procris statices* in some numbers; it is by far the scarcest of the three species on the hill, and I have—as in the case of *P. geryon*—captured it but in one locality. It must, I think, be a mistake that, in the 'Entomologist,' vol. ii., p. 131, it is stated that the larvæ of *Procris statices* mines the leaves of *Oxalis acetosella;* it might feed upon *Rumex acetosella*, but not on the *Oxalis*, which grows in woods—localities in which *P. statices* is never found. On this Cliff Hill, for whose reputation I am most jealous, we find, as I have proved during the month of June this year, the three species of *Procris* living withing a mile and a half of each other, each confined to its own food-plant. *P. globulariæ* and *P. geryon* are mixed together, and *P. globulariæ* and *P. statices* also mingled; but from the totally different position in which *Helianthemum vulgare* grows to that occupied by *Rumex acetosa*, I have never found *P. geryon* intermixed with *P. statices*. The three species of *Procris* are gregarious, and the females have but little powers of flight, so that each flock on Cliff Hill has probably been isolated for thousands of years; especially is this the case with *P. geryon* and *P. statices*, and it would be very interesting to ascertain whether there is any local variation in flocks occurring in widely different localities and in different geological formations. I should welcome with gladness the opportunity of inspecting any of the species obtained from other counties; but I fear that the subject of local variation is not much cared for by entomologists generally, as my request of a similar character with regard to *Gnophos obscuraria* met with but one response, and of *Pieris napi* with none.—J. JENNER WEIR; 6, Haddo Villas, Blackheath, S.E.

CŒNONYMPHA DAVUS—OCELLI ON THE UNDER SIDE OF SECONDARIES.—Newman, when describing this insect in the 'British Butterflies,' p. 101, writes of the under side of the secondaries thus:—"The grey or marginal area has a median transverse darker cloud, in which the position of a series of ocellated spots is indistinctly indicated by mere dots." This description accurately describes the usual coloration of the species; but on the South Downs, near Lewes, the insect is frequently found with well-defined ocelli on the under side of the hind wings. During the month of June, this year, I have paid particular attention to this very common and generally neglected species, and could easily have captured dozens of the variety in question; I have some with as many as six well-defined ocelli, five having the black centre, with a white pupil. I found also that there is much variation in the size of the ocellus on the under side of the primaries; in some it was scarcely more than half, and in others double, the size of the figure in Newman's work. Occasionally, but rarely, the spot on the upper side of the primaries is wanting. —J. JENNER WEIR; 6, Haddo Villas, Blackheath, S.E.

RARE LEPIDOPTERA NEAR PORTSMOUTH.—On the 15th of September, 1879, a friend of mine, Mr. T. Larcom, of Shaftesbury Terrace, Gosport, took a specimen of *Chærocampa celerio* in his garden at dusk. He also bred in the same year a variety of *Euchelia Jacobeæ*, the wings being yellow and black, instead of the usual pink and black. Both specimens were sold last autumn. On the 1st of last August I took a specimen of the larva of *Acronycta alni* whilst feeding on hazel, on the edge of a copse on the northern side of Portsdown Hill, between Stakes and Bedhampton. It spun up on the 4th, making a cocoon of silk and small pieces of the leaves. The imago appeared on the 12th of May of the present year. Insects this season are very scarce in this locality.—W. T. PEARCE; 42, St. John's Street, Buckland, Portsmouth, July 7, 1882.

ACRONYCTA ALNI NEAR DONCATER.—I took a specimen of *Acronycta alni* on May 18th in good condition; it was sitting on the trunk of an oak tree in Sandal Beat Wood, near Doncaster. —L. H. PARKINSON; Avenue Road, Doncaster.

ACRONYCTA ALNI NEAR WAKEFIELD.—On June 7th I had the pleasure of capturing a very fine specimen of *Acronycta alni*, at rest on the bole of an oak at Haw Park Wood, near Wakefield. I believe that the imago of this species has not been taken in this district for some years.—J. WRIGHT; Hadfield Street, Wakefield, June 10, 1882.

STAUROPUS FAGI AT EPPING—I have this year taken in Epping Forest three male and two female specimens of *Stauropus fagi*. The first of these, a fine male, I took on May 7th, and the last two males aud females on June 20th.—F. G. WHITTLE; 2, Cambridge Terrace, Lupus Street, S.W.

DIANTHŒCIA CONSPERSA.—I have this season taken a fine and long series of *D. conspersa* from the palings of the long fences, from Caterham Junction to Stoat's Nest in Surrey. It seems an odd habit for a *Dianthœcia* to be found at rest on a fence; even when the palings are made uncomfortably hot by the direct rays of sunshine. Other fence-loving species were remarkable by their absence, as appears most things in Lepidoptera so for this year.—JOHN T. CARRINGTON; Royal Aquarium, June 20, 1882.

EARLY APPEARANCE OF LITHOSIA PYGMÆOLA.—On July 1st I took a worn male specimen of *Lithosia pygmæola* on the hills here; but this year they are very scarce, as up to the present time (July 25th) I have only taken about twenty specimens.—R. HARBOUR; 1, Landport Cottages, Deal.

On the Scarcity of Lepidoptera in the month of June.—During the greater part of last month I was on the South Downs, collecting Lepidoptera; the weather was on almost every day wet, cold, and windy, and exceedingly few butterflies were on the wing; the only species which could be considered common was *Cœnonympha Pamphilus;* even *Lycæna Alexis* was rare, and *Lycæna Adonis*, usually a common species there, was very scarce; no doubt this was partially due to the cold, but I have long held the opinion, which the experience of this season confirms, that a mild winter is very unfavourable to Lepidoptera. In the evenings almost no Geometridæ or Noctuidæ were on the wing, and a few males of *Hepialus humuli* alone were seen on some evenings. I saw but one specimen of *Pieris*, viz., *P. rapæ.*—J. Jenner Weir; 6, Haddo Villas, Blackheath, S.E., July 4, 1882.

Total failure in Lepidoptera.—Can any of your readers explain the cause of the failure in imagos this year, and if it is generally so throughout the country? I have been many miles in search of, but find hardly any Lepidoptera of any description; not even a *Vanessa urticæ* or any *Pieridæ;* Geometræ and Tortrices are equally rare. Have also been out beating trees and shrubs for larvæ, but cannot find even any of these: there used to come hundreds of moths into the garden of an evening to the flowers, but now there is nothing of the kind to be seen. In fact, I have been out so often for nothing that I have quite given it up for the present.—S. Bradbury; Abbots Bromley, July 24, 1882.

Spring Notes.—I have taken this spring rather more insects than usual. Two appeared very early, viz., *Arctia fuliginosa* on April 21st, and *Euchelia jacobeæ* on April 22nd. *Saturnia carpini*, however, did not leave the pupa till May 1st. *Tæniocampa munda* appeared on February 22nd. Sugar was not successful; I only took *Tæniocampa gothica.* At light I took *Selenia illunaria* and *Anaitis plagiata. Vanessa Polychloros* was more abundant than usual this spring. I have only visited the New Forest once this spring (May 15th), and that turned out a cold dull day. *Fidonia atomaria* and *piniaria* were taken on the heath. Amongst others I took *Lycæna Argiolus* and *Melanippe montanata. Nemeobius Lucina, Argynnis Euphrosyne*, and *Hepialus hectus* have been taken at Southampton this season.—H. E. U. Bull; Millbrook Lodge, near Southampton, June 4, 1882.

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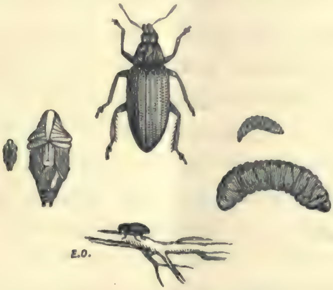
A FEW NOTES ON THE LARVAL STATE OF THE PEA-WEEVIL, "*SITONES LINEATUS*," Linn.

By Thomas H. Hart



Sitones lineatus.

From the time I began the study of Entomology the mystery attaching to the early stages of the pea-weevil has always been a source of attraction to me. Nor have there been wanting circumstances to keep it fresh in my mind. At one time my beans, at another my peas, have been attacked by it to my cost, and I have also attributed to a *Sitones* much of the damage done to my clover in some seasons; but all my efforts to discover the egg or larva were futile. Plants by the dozen were drawn from the infested crops and critically examined, as were innumerable growing plants, but neither leaf, stem, nor root disclosed anything. The old story was repeated last spring. *Sitones* threatened the complete destruction of six acres of grey peas. All the means at our disposal were unavailing to check its ravages, and but for a timely shower to reinvigorate the plants the crop must have been lost. Here, again, all my endeavours to detect the egg or larva were to no purpose, until one morning a letter arrived containing a reference to a clover root-feeding larva. This set me pondering once more, and in the evening I wandered aimlessly into the pea-field, my brain busy with *Sitones*. I went to work, and the result was that before I left I had discovered a small white grub feeding at the root of the peas, which on examination proved to be curculionideous. Elate with my success, I sought and procured more of the grubs, despatched specimens to the care of others interested in the subject, and placed a few in security for my own observation. This was on the 31st of May, and on the 4th of July I had the gratification of seeing the first perfect *Sitones lineatus* in the box where I had placed the pupæ. Thus, by digging up the plants bodily and carefully removing the earth from the roots, was the problem solved, whereas in all previous attempts I had drawn the plants after loosening the soil, and consequently had left behind that of which I was in search. Evidently John Curtis was very near the mark when he examined the bean roots for galls, as mentioned in 'Farm Insects,' p. 345; but probably it was too early in the year. Had he repeated his search at intervals throughout the season there is now little doubt that he would have laid the matter bare some forty years ago.

Contrary to the usual order of things, the pea-weevil does comparatively little mischief in the larval state. True there were indications of the grubs having eaten channels along the main root, but the peculiar gall-like growths on the fibres appear to be their favourite food. It is just possible that they may have to do with certain portions of a crop dying away prematurely in dry seasons by destroying the fibres or causing excrescences to grow on them, and thus diverting the flow of sap from its proper course; but with sufficient moisture, fair tilth, and cultivation there is reason to believe that the plant will arrive at maturity notwithstanding the grubs. The fact that several of the larvæ had ensconced themselves within the above-mentioned galls made me suspect their formation was due to the insect, but I could find nothing in those without a visible entrance to confirm my suspicion.

In its perfect state, however, the weevil more than compensates for the apparent harmlessness of the larva; its depredations are little noticed till the following spring, but no sooner do the peas and beans show above ground than we are painfully reminded of their presence. A succession of wet days, or prevalence of east wind, or other cause to check the plant, and the havoc committed in a short space of time is heartrending to witness. The leaves are scalloped round the edge into fantastic forms, the younger ones often being eaten to the midrib; the stems turn yellow; what remains of the leaves assumes a purplish tint, and, if the weather still continues unfavourable, the crop is lost. Yet the cause of all this mischief is invisible to the ordinary observer. The habit of the insect is to fold its legs and fall at the least alarm, and remain hidden among the clods during the day, coming out to feed at night. Should the soil in which it is secreted be disturbed it will roll about amongst the clods without giving any sign whatever of life; but press the ground for some half-yard square firmly with the foot, go down on one knee, remain motionless, and in a few seconds the place will appear alive from the innumerable weevils that will push their way through to the surface. This gives us a clue to the remedy. If the weather admits of the free and repeated use of the roller, a great proportion of the beetles will be crushed or smothered by preventing them coming to the surface for air, and the plants—freed in a measure from their constant gnawing, and, being assisted shortly afterwards by the hoe—will make new and vigorous growth, and soon bid defiance to what are left of the insatiable little beings.

It would appear that the eggs are deposited beneath the surface of the ground at the time the beetles are devouring the plants, but in what manner still remains to be cleared up.

Appended is a short description of the different stages of the weevil in question:—

The maggot-like larva is white, plump, and wrinkled, with brown horny head, and a pair of powerful projecting jaws. Each segment bears a few short hairs. Legs none; anal segment used as a foot. When full-fed it forms an oval cell without lining, about two inches underground, and at once undergoes transformation.

The pupa is also white, but as it matures the eyes becomes black and the rostrum pitchy; rostrum bent down on to breast; legs folded under thorax; wings and elytra brought round so as to cover posterior pair of legs, not sealed down; each segment with a row of spurs and anal one with a pair of long spines at apex.

The imago is at first creamy white, with head pitchy and eyes black, soon, however, becoming entirely black (with exception of part of legs and antennæ, which are red), and clothed with silver-grey scales, three stripes along the thorax being of lighter shade than the rest. Specimens confined in a box attained their normal colour in about forty-eight hours, but at large the beetles do not appear to leave their nidus for some time longer, probably to admit of their integuments becoming fully hardened before exposure.

Park Farm, Kingsnorth, Ashford, Kent, July 21, 1882.

Note.—With regard to the deposit of eggs, I am able to state that, somewhat earlier in the season than the date at which the larvæ of *S. lineatus* were observed by Mr. Hart amongst the pea-roots, I have found that weevils taken from off the peas paired and laid eggs profusely in captivity. These small white eggs were laid indiscriminately on the glass and cork of the cage, or on any surface, there being no depth of earth wherein to bury themselves for oviposition, and all the eggs perished; but looking at the circumstance of the egg-laying just preceding the time of the larvæ being found, and connecting this with the known habit of the pea-weevil of burying itself in the earth, there seems to me, though we have no direct record as yet on the subject, to be little doubt that in April or May the females go down to oviposit a little below the surface of the ground amongst the pea-roots.—E. A. Ormerod.

CAPTURES AT FOLKESTONE DURING JULY.

By Reginald E. Salwey.

A three weeks' stay at Folkestone during July having proved not wholly unsuccessful from an entomological point of view, may perhaps be worthy of record.

The universal outcry upon the dearth of spring and early summer Lepidoptera quite coincided with my own experience, and I did not arrive at the seaside in a particularly hopeful frame of mind. During the greater part of our stay I was accompanied by Mr. W. Harper, who as usual proved an able assistant; we had to contend against heavy rains and an unusually cold S.W.

wind, which is very disastrous to collecting on the Kentish coast; but, considering the season, we did fairly well.

The usual Diurni were decidedly scarce. We only took one hybernated specimen of *Colias Edusa*, a few *Lycæna Alsus* and *L. Alexis* on the hills, *L. Corydon* at St. Margaret's Bay, and *Hesperia linea* in the Warren. I did not even see *Argynnis Aglaia*, and *Satyrus Hyperanthus* was rarer than is usual; but this species was carefully looked over, and yielded five specimens with spotless under sides. *Arge Galathea* were few and far between, though they abounded at Dover.

The Geometræ were most to the fore. I netted *Acidalia strigilata* in the Warren the day after our arrival, June 30th; this was considered by local collectors a very early date, and there are now in my store-box about two dozen of this *Acidalia*, beaten from clematis, or netted at dusk between the above date and July 22nd. The Warren also afforded us the following Geometræ:—Single specimens only of *Gnophos obscurata* and *Eupithecia subumbrata; E. absynthiata* from ragwort at dusk, a few *Angerona prunaria*, *Acidalia scutulata*, *A. ornata*, and *Cidaria fulvata.* The clematis supplied plenty of *Melanippe procellata* and *Phibalapteryx tersata;* now and then *M. galiata* turned up, and later on *A. gilvaria.* The hedges at the base of Cæsar's Camp and the Sugar Loaf Hills enabled us to add some fine banded *Camptogramma bilineata* to our score; also *Eupithecia isogrammata, Asthena luteata, Ligdia adustata*, and *Cidaria pyraliata.*

Several expeditions to Raindean Wood were fairly profitable. We easily obtained a number of prettily varied *Cidaria russata*, and *C. immanata. Acidalia sylvata* was moderately common, but worn; *Larentia didymata* a pest; *Emmelesia affinitata* and *Scotosia undulata* scarce; single specimens of *Geometra papilionaria, Macaria notata, Melanippe albicillata*, and *Cidaria picata* occurred.

Two trips to St. Margaret's Bay sufficed to provide me with a fine lot of *Callimorpha dominula*, but no noteworthy varieties. The Diurni were much more abundant there than at Folkestone. After working hard in the Warren every available day for *Sesia chrysidiformis*, our score proved lamentably small. This species is comparatively scarce now; six or seven years ago I used to take it plentifully on one small spot, but the constant removal of the food-plant for breeding purposes has indisputably done much to render this beautiful little clearwing rarer at Folkestone.

Setina irrorella also has declined in numbers there of late years. We of course found *Euthemonia russula* on the hills, the female large and strongly marked; the *Calligenia miniata* at Raindean Wood were proportionately large, and many Lepidoptera are above the normal size on that part of the coast. Three "footmen," *Lithosia complana*, *L. complanula*, and *L. griseola*, turned up in the Warren.

A large patch of viper's bugloss (*Echium vulgare*) in full flower at the top of the Horse Shoe Hill afforded us sport at dusk, though several evenings the climb was quite labour lost, the wind proving too violent for any but such plebeian and hardy insects as *Agrotis segetum*, *A. exclamationis*, and *Triphæna pronuba*; but on favourable nights we were able to pick out from a host of the three above-named species a few more aristocratic moths: *Chærocampa porcellus* to start with, and then the Noctuæ: *Heliothis marginatus* next (this *Heliothis* especially favours bramble-blossoms); and later, *Leucania lithargyria*, *L. pallens*, *Neuria saponaria*, *Mamestra anceps*, *Xylophasia sublustris*, *Agrotis corticea*, *Hecatera serena*, and *Cucullia umbratica*; but *Heliothis marginatus* alone came at all freely. When the bugloss faded and failed we tried ragwort, and thistles in secluded corners of the Warren; *Caradrna alsines* was common at the ragwort; *C. cubicularis* and *Leucania conigera* turned up, also the more acceptable *Mamestra furva*. Throughout the month *Bryophila perla* was well represented at rest on the Martello towers, whence we boxed about forty. *Euclidia glyphica* occurred abundantly on the hills, and was in fine condition.

Sugaring did not do much towards swelling the number of our captures; *X. sublustris*, *Minia literosa*, and *M. strigilis* were the most frequent attendants, but the local *Xylophasia* did not abound this year. A very few *Rutina tenebrosa*, *Noctua triangulum*, *N. baja*, and *Hadena dentina* were occasionally attracted. Two nights' sugaring at Raindean Wood only produced one *Cymatophora or*, four *Acronycta tridens*, and a similar number of *A. ligustri*. Among the Deltoides and Pyralides which I brought away, *Rivula sericealis*, *Botys lancealis*, and a fine series of *Ebulea verbascalis* are the most noteworthy.

The number of species generally was not poor, but of specimens remarkably so, especially among the Noctuæ. The decadence of *S. chrysidiformis*, *S. irrorella*, and *G. obscurata* in this favourite locality of late years is to be deplored. I believe a fair number of *Dianthœcia albimacula* were taken on this part of the coast during June, and the luxuriant and varied mass of wild flowers in the Warren, which is spreading rapidly over the scene of the well-known landslip, should, if undisturbed, prove an attractive bait in future years to many good species.

Summerfield, Weybridge, August 15, 1882.

NATURAL LOCALITIES OF BRITISH COLEOPTERA.

By Rev. W. W. Fowler, M.A., F.L.S.

No. VII.—SALTERNS AND SALT-MARSHES—WATER COLLECTING.

Salt-marshes contain many peculiar plants, and to these certain beetles, especially Curculionidæ, attach themselves: thus *Apion limonii* may be found in abundance on the sea lavender (*Statice limonium*). Many good Carabidæ may also be found under stones or running on the mud, but they do not differ as a rule from those already referred to as frequenting damp parts of the sea-coast.

One of the best collecting grounds in the country is Lymington Salterns: the Salterns consist of a series of ponds, some empty, and some half full of brackish water, with the dry parts and the intervening spaces covered with maritime plants; at the roots of these plants or running upon the sand many species may be found. My wife found the rare *Anthicus salinus* in abundance in April, and also *Gronops lunatus*, and later in the year I found *Sibynes arenariæ* in the greatest profusion, and several other insects I wanted. I only had part of a day to collect in, or I have no doubt that I should have found many good beetles (such as *Aëpas*, *Dyschirii*, *Bledii*, &c.). I should strongly recommend any Coleopterist who visits the New Forest to run down and work the Salterns for a day at least, as they are a very short distance from Lyndhurst and Brockenhurst; they used to be a very favourite locality with many of the old collectors, such as Mr. Dawson and others, if we may judge from the frequent allusions made to them in their writings.

With this passing mention of salt-marshes, which properly belonged to the last paper, we must go on to the main subject of our present one, namely, water collecting. The water beetles are a study in themselves, and require special working and special apparatus.

The net used should be made of cheese cloth, and it is best, as was said in the introductory paper, to have its edges furnished with rings instead of with a turned-down edge of stronger material, as is often the case; nets thus made are easily run on and off the large ring of the net, and so a water-net may very readily be substituted for an ordinary sweeping-net, or *vice versâ*.

The usual round net is quite sufficient for ordinary water working, but if there is much moss or growth surrounding the water, as is the case with ponds on boggy land, by far the best form of net to use is an oblong or semicircular one, made with a straight metal edge or edges (like a prawning-net in fact), for scraping the sides, as great numbers of the best beetles, especially *Philhydrida*, are thus obtained, which would be entirely missed by the ordinary net. Archdeacon Hey, of York, has designed several of these nets for working Askham Bog, which he has done with very great success, and taken many hitherto very rare beetles in numbers.

A few words as to setting water beetles, more especially *Hydropori*, may be useful. The best plan is to keep them alive in damp moss, kill them with boiling water, and brush them out and set them at once: they are killed so instantaneously that brushing out the limbs may almost be dispensed with. If, however, this plan cannot be adopted, they may be put in the usual way into the laurel bottle, but should never be left more than one day. As they are of course always damp when caught, if they cannot then be set it is best to put them in muslin bags and dot them on card at one's leisure, without attempting to set them, as there is nothing more trying to one's patience than the attempt to set a refractory *Hydroporus*. The hind legs, especially of the *Agabi* and like genera, are always a difficulty; they may either be drawn down and set parallel to one another, or curled over the back; the former is much the neater plan, and may usually be managed by gumming the front part of the insect strongly to the card and letting it dry, when the hind legs may in most cases be easily drawn down to the required position.

The water beetles, as a rule, are not very brightly coloured, but we find that the brighter species inhabit running streams, while the duller ones are found in stagnant water, the former are usually the best species, but this may be due to the fact that the latter are more easily found, and therefore commoner.

Almost every stagnant pool in summer contains some beetles, and very often a tiny puddle will yield a more abundant harvest than a large pond: the water beetles are amphibious, or more than amphibious, for they can swim in water and walk on land, while their ample wings enable them to fly powerfully through the air; in consequence of their facility of movement from place to place, we find quite recent pools and puddles sometimes alive with beetles; drought does not affect them, for if a pool dries up they do not perish like the fish and other inhabitants, but have only to seek a fresh habitation; they are not very discriminating, and are evidently guided to water by sight, for they are often found on hot-bed frames, on which they have dashed themselves, mistaking the reflection of the glass for the reflection of water.

The commonest beetles in all stagnant waters are *Hyphydrus ovatus*, *Hydroporus palustris*, *Haliplus ruficollis*, *Agabus bipustulatus*, *Hydrobius fuscipes*, and one or two *Helophori* and other *Philhydrida*. There is hardly a pond or ditch in which these are not found, and there are many others that are almost equally common; even the rarer species as a rule are rather local than scarce, and where one specimen is found many more may usually be procured by closer examination. Thus *Spercheus emarginatus*, which used to be one of the very rarest of our British water beetles, only one or two specimens from Yaxley Fen being known, was rediscovered by Mr. Billups near West Ham, where Messrs. Perkins and Champion found it in numbers. Not long ago Mr. Harris, of Burton, found the rare *Haliplus mucronatus* in abundance at Weston-super-Mare: there are however exceptions; thus *Hydroporus oblongus* and *H. Scalesianus* are always rare in Askham Bog, almost their only known locality, and *Hydroporus unistriatus*, the rarest of the *Hydropori*, seems always to occur singly at wide intervals of time. *Cybister Rœselii* has been said to have occurred at Walton, in Essex, and a specimen was formerly in Mr. Griesbach's collection, but it is very improbable that such a large beetle should have escaped notice if really indigenous, and it ought certainly not to be reintroduced into our list.

Cnemidotus impressus, the first of the water beetles in the British list, is found in stagnant waters near Putney and Wandsworth. *Pelobius Hermanni*, *Hydrophilus piceus*, *Hydrous caraboides*, and *Dytiscus circumflexus* are also insects that particularly affect the London district; the first three are much sought after for the aquarium, and used to be collected and brought to Covent Garden for sale for this purpose. The *Hydropori* are a very large, and in many cases a very obscure group; the brighter coloured species, such as *H. 12-pustulatus*, *H. depressus*, *H. assimilis*, *H. fluviatilis*, *H. septentrionalis*, *H. pictus* and others, are usually found in running streams, accompanied by *Brychius elevatus*, and also *Haliplus obliquus*, which latter insect, however, seems to be found in both running and stagnant water. The *Hydropori* that frequent the deeper parts of running streams are usually found attached to logs or stones, and sometimes may be found abundantly under stones at the bottom, after the fashion of the *Elmides*. *Hydroporus latus* is found in lakes among stones in the same way, and this perhaps explains its rarity. *Hydroporus minutissimus* is only found on the edges of the large fresh-water basin close to the sea at Slapton Ley, in Devonshire, where it was discovered by Mr. Wollaston, and with it *Limnius troglodytes*, which latter beetle, however, has been found elsewhere in numbers by Dr. Power.

The smaller *Hydropori*, such as *H. atriceps*, *H. umbrosus*, *H. tristis*, *H. obscurus*, and others, are very obscure; the majority of them may be found in Askham Bog, near York; of these and the other Askham Bog beetles I have lately given a full account in the 'Entomologist's Monthly Magazine' (vol. xviii. pp. 7—9; June, 1881), and need not again enumerate them. Some of the *Hydropori*, such as *H. lituratus*, *H. memnonius*, and sometimes *H. tristis*, seem especially to prefer small ponds in woods, while others are fond of brackish water, such as *H. confluens*, which I have found in abundance in pools at Hunstanton, within a few yards of high-water mark; others again are quite indifferent. I have found *H. lepidus* in profusion in a stream near Bournemouth, quite close upon the sand, and also in a pond in a wood near Lincoln.

The species of the genera *Noterus*, *Laccophilus*, *Colymbetes*, and *Ilybius*, with very few exceptions, are all common in stagnant waters all over the country. With regard to the *Agabi*, *A.*

striolatus and *A. tarsatus* appear to be almost unique; *A. brunneus*, found by Dr. Power in the New Forest, is very scarce, and the local Scotch species *A. congener*, *A. arcticus*, and *A. affinis*, are always in much request.

The genus *Dytiscus* is very hard to complete. *D. punctulatus* and *D. marginalis* are common, the latter extremely so, but *D. lapponicus* is a rare northern insect, and *D. circumcinctus* and *D. dimidiatus* are almost peculiar to the fens, especially Yaxley Fen and Whittlesea Mere, although a single specimen of the latter insect and a few specimens of the former have been found in Askham Bog. It is strange how rare the latter species has become. I have heard an old collector say that he has known it taken literally by pints.

The *Hydatici* are all rare, *H. cinereus* especially so; all three used to be found in the fens, especially in Whittlesea Mere, *H. seminiger* being very abundant.

The Gyrinidæ are a very obscure group, and some of our species are very doubtful; *G. marinus* and *G. natator* are very abundant, and *G. urinator* is said to be common in the north; *G. minutus* is common in Scotland, and *G. bicolor* is to be found in many places on brackish water. *Orectochilus villosus* is only found on running water, and is not often seen unless looked for close under the banks, as it comes out by night, and remains hidden by day. I have found it abundantly on the banks of the Dove, near Repton.

The School House, Lincoln.

[*Hydroporus oblongus* was *originally* found by me at Cambridge, and afterwards in the Norfolk fens.

Hydroporus latus.—I have seen in two places: one is a rapid stream, not far from Tilgate Forest; the other is a stream in Tilgate Forest. In both it was abundant: I got about 200 specimens in the two together.

Cybister Rœselii.—The specimen is now in my collection. Its authenticity is somewhat dubious, but the story of its capture, attached to it, is very definite.

Agabus striolatus.—I believe was only taken once, and that by my friend Rev. Laundy Brown, of Norwich, more than forty years ago. It was in a ditch in one of the Norfolk fens. He took about sixteen of them; six or eight are still in my possession.

Both Mr. Brown and myself have searched the same spot, but without avail.

Agabus tarsatus.—I only know of one specimen, in my own cabinet, from Orkney.—J. A. P.]

COLEOPHORA INULÆ:

A SPECIES ADDED TO THE BRITISH FAUNA.

By William Machin.

When collecting along the road leading from Dorking to Leith Hill, about twenty years ago, I found on plants of *Inula dysenterica* some cases of a *Coleophora* larva, which in due course reached the perfect state, and were named for me *C. troglodytella.* Last year, in the neighbourhood of Gravesend, I met with cases of a *Coleophora* larva on this plant, which differed so much from those above referred to that I concluded we had here two species under one name. In April last I submitted a small series of each of the above named to Mr. Stainton for his inspection; on referring to his splendid continental collection, the first-named proved to be *Coleophora inulæ*, a species new to this country; the latter being *C. troglodytella.* The two species are very closely allied, but on inspecting the insects Mr. Stainton at once pointed out the more pointed wings of the latter.

The principal difference is, however, in the cases, that of *C. inula* measuring fully 7 lines, and the case, when the larva is feeding, lying almost flat to the leaf; while that of *C. troglodytella*, which measures about 4 or 4½ lines, occupies a comparatively upright position. Both of the species occur in the larval state in June.

22, Argyle Road, Carlton Square, E., August 17, 1882.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Entomological Notes on the Season.—So far as my experience goes, 1882 has been a very dull year for the lepidopterist, and but for the breeding of several good species I should have very little to show for my labours. Three or four trips to Tilgate during May and June gave for result nine *Sesia sphecíformis*, which I bred, and four imagines taken at large. After closely watching the economy of this rare clearwing, I am perfectly convinced that it lives three years in the larval state. Although I have not reared this species from the egg, still I have kept a strict attention to certain larvæ feeding. Three weeks were spent at Deal, and although during the six years I have known them I never saw the sandhills look more promising, or ever saw vegetation more luxuriant, still Lepidoptera were but poorly represented; the usual local species were, generally speaking, far less numerous than in previous seasons. Of some species that usually are abundant there, such as *Aspilates citraria, Stenopteryx hybridalis*, and *Scopula ferrugalis*, which in some years are in thousands, I did not observe a solitary specimen of either species. *Acidalia ochrata* followed the rule of scarcity, not more than ten per cent. in number of last year's brood. *Nyctegretes achatinella*, too, required much more working for to get a fair series. *Acidalia emutaria* only very few; and of *Melia anella*, generally a fairly common species here, I only saw two specimens. *Lithosia pygmæola* was fairly common in third week in July; on one or two favourable nights anyone could have taken hundreds of it. One night I secured ten *Nola centonalis;* curiously three pairs *in copûla;* this, in my experience, was a most exceptional night's work: I secured fertile eggs, and have now larvæ feeding. Although I worked specially for *Scoparia lineola*, only four rewarded my search. By the sides of some rushy marsh ditches *Nonagria despecta* swarmed; one could get six or eight at one sweep of the net, and it was by far the most abundant species I met with; of course it was confined to these ditches. Some of the commoner Noctuæ were fairly abundant, but nothing of any note fell to my net. The results from my breeding-cages have been more satisfactory. In March I bred *Petasia nubeculosa* and *Endromis versicolor*, both from Scotch eggs; of the latter species, which were of a particularly fine dark type, I secured fertile eggs, and succeeded again in obtaining pupæ; about one-half of the first brood are still lying as pupæ. During June I bred a very fine series of *Dianthœcia albimacula* from the larvæ I obtained last year near Dover; this season I again worked for it, but curiously the plant from some cause was almost a failure. Where last year I could have filled a sack with flowers and seed-heads, this year I could only fill a pill-box, and not nearly sufficient to feed the four larvæ I did find. From twenty-six hybernated larvæ of *Nola centonalis* I reared twenty-three very fine imagines, and obtained fertile eggs, which are now duly emerging as moths, second brood. *Acidalia ochrata*, *A. degeneraria* and *A. emutaria* were successfully hybernated and bred in June and July; also a very fine series of *Acidalia strigilata*, from eggs I secured whilst at Folkestone last year. *Acronycta alni*, five bred on whitethorn, from five eggs. A fine series of *Tephrosia extersaria*, from the egg; and during July and August I reared a beautiful series of *E. autumnaria*. Also eight specimens of *Cidaria picata*; this is a glorious species when bred. These and a lot of commoner species have kept the season from being dull, as in captures alone it would have been.—W. H. TUGWELL; Greenwich, August 10, 1882.

NOTES ON THE SEASON.—Early in May, on the moors, insects seemed to be in plenty. *Thecla rubi* was in swarms: for a bit of fun I caught six at one stroke, when they were engaged in pugnacity; I told my daughter if she saw any that could scarcely fly to take them, as it was the best chance of getting a variety, especially if a cripple. It turned up as hoped for; one specimen shows the brown on the under wings, as in *T. pruni*. This is the first variety of *T. rubi* that I have ever seen. *Nemophora pilella*, only one specimen turned up; and I sent again, with not much better result. However, I went again and took my son, who had not known how to follow the sun, and captured about sixty specimens. When the sun shone on a small patch of bilberry in a clearance of the fir wood, about 11 o'clock, they kept rising out of the undergrowth, and I continued finding up to 3 p.m.—places, as the sun went round, that were alive with insect life, where previously I could not see a moth; and at the spot that I visited at 11 no life was seen, hence my great catch. Early in July I paid a visit to Witherslack to get some *Chortobius Davus* for a friend: a false rush at one cut my career short, for a tendon of my right leg snapped, and I am as lame to-day as then, and likely to be so for a long time to come. However, I went to spend a week, to rest my leg, at Arnside, in Westmoreland. I managed to hobble a little, and strange to say a small moth flew past: my wife took the net, and brought back a female *Eupithecia pygmæata*. Two days later I took another, which is alive yet, and I hope to have eggs from them. This species is quite two months late. At the same time a white moth flew past, which was *Emmelesia* *alchemillata*, fresh as just out of pupa. This species I took worn early in May this year. Soon after I took *Bucculatrix aurimaculella*, another early species. Among the *Rosa spinosissima*, *Penthina incarnatana* was not rare. Among the *Helianthemum*, *Laverna miscella*, *Butalis fuscoæneella* and *Gelechia sequacella* were in plenty. Towards 7 in the evening another tribe began to appear, viz., *Elachista biatomella*, *E. eleochariella*, *E. bedellella*, and *E. adscitella.* A little higher up *Erebia Blandina* was in swarms; so were *Larentia olivata;* but being able only to go at snail's pace, I had to be content with odd ones that came near me. Among the *Hypericum*, *Gelechia atrella* turned up; and among dead sticks *Œcophora fuscescentella* appeared, worn as usual. I sent my son to Windermere for *E. conspicualis*, but he did not see a specimen; and only one worn *Emmelesia tæniata:* the heavy rains and cold weather made a moth of any sort a treat to see. He only got about six moths, and some of those were "pea-green's" (*Tortrix viridana*) washed white. I succeeded in breeding *Emmelesia tæniata* from the egg. Its life-history I will send you some day.—J. B. Hodgkinson; 15, Spring Bank, Preston, August 13, 1882.

Remarks on the Season.—The present scarcity of Lepidoptera has led several of your correspondents to comment upon the subject. I should also like to add a few remarks, so far as my personal experience will permit. In New Malden neither June nor the early part of July have yielded me half a dozen specimens worth recording, although I have worked diligently with the net at twilight, sugared favourite trees, and later on searched the gas-lamps. Whilst speaking of the last mode of collecting, perhaps one capture is worthy of notice:—On July 14th I took *Orthosia suspecta*, a species I have never known to occur in this village before. The season, as a whole, in this part of Surrey, I believe, is one of the worst known for many years. Now, bearing this fact in mind, it does seem strange that the horticulturist should be justly entitled to complain of his insect enemies. Nevertheless it is so; for *Aphides* have occurred in enormous numbers, attacking vegetation in many of its varied forms. To give an idea of their abundance,—just imagine the trunks of oak trees altered in colour, and the ground for some few inches around the base of each raised two inches above its normal level by a moving mass of animated nature; then will one be able to conceive what the writer witnessed in Coombe Wood during the hot morning sunshine of July 2nd. Having briefly referred to the unwelcome result of insect hunting in this neighbourhood, it is refreshing to be able to report more favourably of day-flyers seen or taken during a visit to the New Forest, extending over the last eight days of July. Here *Argynnis Paphia* was out plentifully, but its variety, *Valezina*, wanted much looking for. *A. Aglaia* and *A. Adippe* were in fine condition. *Leucophasia Sinapis* and *Rhodocera rhamni* were splendidly fresh; the latter could be taken by scores. *Melanagria Galathea* occurred but sparingly. The genera *Pyrarga*, *Satyrus* and *Epinephele* were represented by all their members, except *S. Megæra;* while the *Lycænæ* could produce but one species, viz., *L. Argiolus*. Among the "skippers," *Hesperia sylvanus* and *H. linea* were common; as also were *Pieris napi* and *P. brassicæ*, although *P. rapæ* was conspicuous by its complete absence. To sum up in a word, I took or saw in two days, consecutively, twenty-one species of Diurni, which is as much as could be reasonably expected from our limited list, even if the season were a first-class one. Had the other modes of collecting been equally prolific, I should have had no cause to complain of my visit; but in no other means that were adopted could I get a trace of success: beech, birch and sallows were beaten for hours without producing a solitary larva. The net was used at twilight for Geometræ, without taking upon an average one specimen each evening. Sugaring at Boldre Ford did not necessitate opening the bottle; and after several night's work of the same description, in company with Mr. A. Mitchell, in Holland's Wood, we could only count up twelve species of Noctuæ between us. *Cosmia trapezina*, *Amphipyra pyramidea* and *Triphæna pronuba* were the most abundant; *Catocala promissa* appearing but twice. In addition to the Noctuæ our sweets attracted *Lithosia quadra* and one *Cossus ligniperda*. One *Triphæna subsequa* was turned up from grass in the daytime by my companion, who fortunately secured it. Of the Micro-lepidoptera I can say nothing, for it was difficult to find twice as many species as there are inns in Brockenhurst, where the weary collector can rest and refresh himself without being considered the follower of a mere childish pursuit, but will be regarded as a student of an interesting branch of Science.—H. T. Dobson; New Malden, Surrey, Aug. 11, 1882.

GREAT SCARCITY OF LEPIDOPTERA.—I can bear testimony with others as to the scarcity of Lepidoptera this year. I have hunted regularly and carefully, with but indifferent success; species which used to abound here I cannot meet with. For example, *Anarta myrtilli* is common in two parts of the Quantoch Hills, but this year I have not taken a single specimen. In this connection let me mention a curious fact, which I should be glad to have explained. For three weeks previous to the setting-in of the wet weather in June I "sugared" regularly in my garden, three or four nights a week. Noctuæ were plentiful, several times there was a "very crowd." Among others I took *Thyatira batis*, one specimen of *Cymatophora ocularis* in excellent condition, *C. ridens*, and *Dianthœcia carpophaga*. From this I anticipated a good season; but a week after the wet weather set in every *Noctua* disappeared; and to this day, though I have "sugared" most perseveringly, I have seen but one single moth at sugar, and that a *Triphæna pronuba*. The total disappearance was as sudden as unaccountable, at least to me.—[Rev.] J. SEYMOUR ST. JOHN; Crowcombe Rectory, Taunton, August 15.

SCARCITY OF INSECTS.—Probably the oldest collectors will agree with me that this season so far has been the very worst, as far as Lepidoptera are concerned, within the whole range of their experience. Such unquestionably has been the case in the south. Perhaps some one will favour your readers with the state of matters in the North of England or Scotland. Has the mild winter allowed the enemies of our lepidopterous insects to increase to such an extent as to threaten their extermination? How does it happen that one of the severest winters on record, *viz.*, 1879–80, was followed by an exceptionally good season for insects, and one of the mildest winters by one of the very worst seasons within our recollection?—W. MCRAE; Bournemouth.

MELITÆA ARTEMIS IN NORTH DEVON.—In Mr. South's notice of captures in North Devon I see he does not mention *Melitæa Artemis*. My brother found two of the larvæ near here on the 18th April; they became pupæ on the 27th, and produced fine females on the 23rd and 24th May. On the 29th May, Miss Hinchliff and I took our nets to the marshy field where the larvæ had been found, and, on that and the following day, caught over seventy fine specimens. We could have taken many more.—[Mrs.] F. S. MATHEW; Instow, North Devon, July, 1882.

Sphinx pinastri.—As Editor of this magazine I have received the following letters, which will speak for themselves. Is it possible these correspondents have come across an instance of the amateur colonisation referred to (Entom. xv. 114) by me recently?

July 20.

Dear Sir,—I wish to call your attention to the capture of several pairs of *Sphinx pinastri* (in one of the eastern counties) by myself and friend during the present month, and would be glad of some information as to how to dispose of them to collectors, not being an entomologist myself. I can give the highest references in the neighbourhood as to their genuineness.

July 21.

Dear Sir,—Two friends and myself have taken some specimens of *Sphinx pinastri* in this county during the last fortnight. We are desirous of selling some of them. If a short paper on the subject of the occurrence of this rare insect would be of use to 'The Entomologist' I shall be happy to write and send you one. I would offer these insects at per pair, and perhaps you will kindly let me have your opinion as to what amount should be asked.

I have omitted the writer's names, not having their permission to insert them.—J. T. C.

Acherontia Atropos in London.—On the 2nd of May last the brother of a friend took, on the window-sill inside the office of a stockbroker near the Royal Exchange, City, a large specimen of *Acherontia Atropos*, which had, from its worn appearance, probably been hybernating in or near the office.—T. Sayer; 53, Ladbroke Grove Road, Notting Hill, W.

Eupœcilia flaviciliana.—On July 16th I captured, in St. Margaret's Bay, a short series of this very local species. I did not find the exact spot for them until the last night of my stay, or probably I should have secured a longer series. As some of the specimens are rather worn, it would appear that quite a week earlier than this date would be the proper time to get them in fine condition. During a visit of sixteen days' duration I tried sugar, and the natural attraction of the flowers, with very poor success. The only moth that came in any numbers was *Agrotis exclamationis*, with an occasional *Xylophasia sublustris* to vary the monotony of the evening. *Callimorpha dominula* was in its usual abundance, but an examination of some hundreds failed to produce any varieties worth mentioning.—J. A. Cooper; 22, Bingfield Street, London, N., August 11, 1882.

STATHMOPODA PEDELLA.—One windy day in July last I was beating about on the lee-side of a long clump of alders in Suffolk with the hope of stirring out any Lepidoptera there might be sheltered among the foliage, but after nearly an hour's hard work I had only captured a few insects, none of which were worth retaining. In the field was a solitary alder tree, the top of which at some time had been broken off; around the stem was a tangled mass of young alder shoots and bramble, among which, on the ground, a quantity of *débris*, including plenty of last year's fruit, had collected. Although I did not expect to get anything from this particularly exposed tree, after so unsuccessfully working the more sheltered clump, I was surprised to find two queer-looking insects in my net, the result of the first beat. I at first thought they belonged to the coleopterous order, but, having boxed them, I found that they were true Lepidoptera, which I subsequently made out to be *Stathmopoda pedella.* The curious habit this insect has of bringing the hind pair of legs forward and sticking them out at right angles with its head, like antennæ, in conjunction with its shape, coloration, and markings, are so suggestive of a beetle, that one might easily mistake and consider it a coleopteron. Subsequent visits produced in all seven specimens from the tree; one only, a wasted specimen, from the clump of alders.—RICHARD SOUTH; 12, Abbey Gardens, St. John's Wood, N.W.

NOTES ON THE TIME OF APPEARANCE OF SOME RARE WATER-BEETLES.—I have often been struck with the vagueness of our information as to the time of year when our water-beetles are to be found; moreover, when I have found any information my experience has frequently contradicted it. Consequently I resolved this year to make some accurate notes as to the time when the rare *Hydradephaga* of Askham Bog appeared, when they were most abundant, and when they ceased to be found. I have made many visits to the bog since January, and kept a very close account of my captures, with the following results:—*Hydroporus Scalesianus.*—This insect, which I believe is in this country confined to Askham Bog, appeared as early as February 9th, when I took two specimens; on March 17th it was abundant, and after that became scarcer by degrees. *H. oblongus.*—One specimen appeared on February 11th; in the middle of March it was frequent; in April it became scarce, and could not be found after

May 22nd. *H. rufifrons.*—This species, unlike the two preceding, exists through the whole year, except perhaps in July; even on January 3rd it was abundant; on March 9th, after heavy rain, it appeared in prodigious quantities on the flooded ground: it only occurs in very shallow and temporary puddles. *Agabus abbreviatus* appeared on February 9th, became most abundant on March 11th, and continued so till May. *A. uliginosus* was abundant as early as January 3rd; in March it became less common, but it exists all through the year, and is specially abundant in September. *A. agilis* appeared on February 11th. *Dytiscus dimidiatus.*—I believe this fine beetle has not before been recorded from Yorkshire; I took one male on March 11th. *Colymbetes Grapii.*—This species appeared on March 9th, when I took one specimen; after this a few turned up at every visit till midsummer. *Hyphydrus ovatus* appeared on March 17th, and soon became abundant. I think these observations show us that many of the *Hydradephaga* appear much earlier than is commonly supposed; moreover, the rarest species appear to be the earliest. Is it possible that they are not so rare as is commonly supposed because they have a very short season, and that at a time when pond-collecting is generally neglected?—W. C. Hey; York, August, 1882.

[In accordance with Archdeacon Hey's observations, I have always found the rarest aquatics (water-beetles have from the earliest days been my pets) in very early spring, such as *Hydroporus nitidus* (which I was the first to discover), *H. unistriatus*, *Agabus uliginosus*, &c., which I used to get with many others at Cambridge. *Hydroporus neglectus* I used to get at Lee when the snow was on the ground; in June and July I found them all but disappear, but in August and September many, if not all, again appear; and I was once only at Askham Bog for three hours, with the archdeacon, on August 13th, 1872, and found, of those he mentions, *Hydroporus Scalesianus* pretty abundant (I have recorded seventeen), *H. rufifrons* and *decoratus* in profusion, *H. tristis* common enough, *Agabus abbreviatus* plentiful, and *A. uliginosus* in fair numbers (I got about twenty). The more common species were plentiful.—J. A. P.]

Coleoptera at Shere.—By sweeping some rough grass under a hedge last week I obtained a specimen of *Cissophagus hederæ*, Schmidt. This insect, though included in Mr. Cox's handbook, is not mentioned either in Dr. Sharp's list or in the more recent one by Mr. Francis Pascoe, just published. It may not have been discovered in Britain prior to the date of Dr. Sharp's, but I see no reason for its being omitted in Mr. Pascoe's, as there can be no doubt of its being a native. I have also met with the following Coleoptera in this neighbourhood during the past summer:—*Lissodema cursor*, *Agrilus angustulus*, *Atemeles emarginatus*, *Lyperus flavipes*, *Melanotus castanceipes*, *Callidium violaceum*, *Erirhinus tortrix*, *Mantura obtusata*, *Prionus coriarius*, and *Megacronus cingulatus*. On the whole, however, insects have been scarce this season, more especially the aculeate Hymenoptera and the Ichneumons.—EDWARD CAPRON, M.D.; Shere, Surrey, August 14, 1882.

NOTES ON THE LIFE-HISTORY OF PHÆDON TUMIDULUM, *Kirby*.—Wishing to ascertain if *Heracleum Sphondylium* was really the food-plant of this beetle, I commenced searching early in the spring in the hope of finding eggs deposited on the plant. In this, however, I was disappointed; but on the evening of May 7th I came upon a colony of some hundreds of tiny black coleopterous larvæ feeding on the under side of the leaves, and from their general resemblance to certain phytophagous larvæ with which I am acquainted I concluded they were those of *Phædon*. Even here I failed to detect the vestige of an egg, although, judging from what they had eaten, the larvæ had been hatched but a very short time. The spot being unlikely to be disturbed, I resolved to leave the little grubs on the growing plants until I thought them about full-fed, at which time I secured about a dozen of the largest, and placed them in a jar with food, and a layer of earth at the bottom. Some of them continued feeding, but others burrowed at once, and the first beetle emerged on the 29th of June. Thus it is probable that in their natural state they pass from the egg to the imago in about eight weeks When first discovered the young larvæ were dull black, but became lighter with each successive moult, until they were of an olive-green, with head, legs, and tubercles (of which there were four on each segment) shining black. When full-fed they descend to the ground, burrow, and change to pupæ. These latter are pale yellow at first, but eventually become of an ochreous colour, very convex above, head depressed, legs lightly folded against the thorax, and the wings and elytra brought round under the abdomen. The newly-emerged beetle is pale yellow, with two black spots, sometimes confluent, on the thorax, but the insect does not appear to leave its burrow until it has assumed its normal tint of metallic-blue or bronze, which is effected in the course of a few hours. The above confirms the opinion to which I gave expression at page 24 of the present volume, but it remains to be seen whether or not hog-weed is the only food-plant of this insect. With regard to the other species, *P. cochleariæ* has bred as usual in a watercress-bed, and also attacked some radishes in my garden, but as yet I have failed to detect *P. betulæ* (Sharp's Cat.) anywhere. — THOMAS H. HART; Kingsnorth, Ashford, Kent, July 8, 1882.

DESCRIPTION OF THE LARVA OF LÆMOPHLŒUS FERRUGINEUS, *Stephens.*—So little is known about the larvæ of British Coleoptera that I think any information respecting them should be at once recorded, and therefore I send you a description of the larva of *Læmophlœus ferrugineus*, Steph., a species, the larva of which has not hitherto been described, and which I have recently reared upon the cork of a bottle containing British Mollusca in spirits of wine. The larvæ were discovered in some numbers tunnelling the cork in all directions. Long, rather narrow and depressed, slightly convex above, flat below, of a pale yellowish white colour, except the head and last segment, which are brownish yellow. Head a little broader than long, flattened, sparingly covered with short silky hairs, strongly emarginate behind, anterior and lateral margins rounded, posterior margin usually hidden beneath the first thoracic segment, although the larva has the power of projecting the head considerably beyond it; marked with a narrow brown stripe, commencing at each side of the base of the labrum and continued to the posterior margin; labrum small, nearly semicircular; mandibles short, strong, and simple; labium clothed with minute hairs; labial palpi very small, composed of two joints, the second being slightly the longer and thickened at the apex; maxillæ short, incurved, lobe small; maxillary palpi four-jointed, of which the first three are equal in length, the fourth being narrower, and as long as the second and third together; antennæ formed of four joints, the basal large and broad, the second much narrower and not so long, the third as long as the two first, gradually thickening towards the extremity and bearing a minute spinous excrescence at its apex, the fourth narrow and not quite so long as the preceding. Thoracic segments semitransparent, sparingly covered with hairs, anterior angles rounded. Abdominal segments increasing in width until the fifth is reached, when they rapidly decrease; the eighth longer than the others, having the posterior angles very obtuse; anal segment narrow, and terminated by two sharp rigid spines, in some specimens slightly curved inwards. Nine pairs of stigmata. Legs well developed, and covered with fine hairs; claws small, simple, and sharply pointed. Length, 4 mm.; greatest width, $\frac{2}{3}$ m. This larva is easily distinguished from that of *Læmophlœus Dufourii*, Laboulbène (described by M. Edouard Perris in the Ann. Soc. Ent. France, 3rd series, vol. i., p. 618), by having the posterior margin of the head concave or arcuate, instead of straight. It also differs in this particular from the larva of *L. ater*, Oliv. (*Cucujus spartii*, Curtis), a figure and short description of which appeared in Westwood's 'Introduction to the Modern Classification of Insects,' vol. i., p. 146. The larva of *L. ferrugineus* is very distinct from either of those of the above-mentioned species, but space does not admit of my entering into minor differences; they will, however, readily be made out upon reference to the original descriptions.—H. SIDNEY OLLIFF; 36, Mornington Road, Regent's Park, N.W., August 12, 1882.

[Compare Carpentier's note on the larva of *Læmophlœus ferrugineus* in Bull. Soc. Linn. de la Nord du France for April, 1877.—E. A. F.]

LIMNERIA KRIECHBAUMERI, *Bridgman.*—This Ichneumon I have bred from the larva of *Tæniocampa stabilis*, and it always emerges when its victim is nearly ready to moult for the fourth time. Its cocoon is oval in shape, and of a chocolate colour, with a central whity-brown zone, and is 6 mm. in length and 4 in breadth. The object of my writing this note is to record the very strange propensity the pupa has of jumping. I first noticed this peculiarity about sixteen years ago; since that I have often exhibited it to my non-entomological friends as a "curious jumping seed." I have known it to jump four feet in a horizontal direction, and about two feet when a perpendicular bound has been tried. I have closely watched it many times, but could never see any preparation by contraction or otherwise before the jump; and from experiments I have made with cocoons I am fully convinced that the jumping is done to secure for themselves shelter during the time the species is in pupa, for I find if they are taken from the leaf and placed in moss they soon work themselves down by rolling from one side to the other, but if placed in a box the jumping continues many days; and I have every reason to believe that they get so exhausted with the effort that they seldom come to maturity. *L. Kriechbaumeri* escapes from its victim, while the larva is on the tree, in the beginning of June, and does not emerge from the cocoon until the following April. I believe it confines its attacks to *T. stabilis;* so far I have not obtained it from anything else.—G. C. Bignell; Stonehouse, August 7, 1882.

External Parasites of Spiders.—Mr. Fitch, in his paper on this subject (Entom. xv. 169), does not mention the exhibition, at the meeting of the Zoological Society on February 15th, 1881, of examples of *Acrodactyla degener*, Haliday, bred by myself in the preceding year from larvæ adhering to the outer surface of the abdomen of two species of spider,—*Linyphia obscura*, Bl., and *L. zebrina*, Menge. The empty cocoons and spiders were also exhibited. Fuller details of the above were published in April, 1881, in 'Spiders of Dorset,' part ii., p. 579, by the present writer. The name of the parasite was, by a clerical error, given as *Acrodactyla Degeerii;* corrected, however, in the "errata." These larvæ are in some seasons very abundant: I have found them not only on the above-named spiders, but on several species of *Theridion*, as well as on other species of *Linyphia*, and on some *Epeirids*. It is possible that more than one species of parasite has been concerned, though all the larvæ which have come under my own notice appeared to be identical. Mr. Parfitt seems to have been under the impression that the larva from which he bred *Acrodactyla degener* was an internal parasite, obliged to come outside owing to the body of the spider not being large enough to contain it. This is, I think, a mistake. These external parasites are probably hatched from eggs affixed to the outer surface of the spider's abdomen, or at any rate very slightly inserted.—(Rev.) O. P. Cambridge; Bloxworth Rectory, August 1, 1882.

Erratum.—At p. 190, vol. xv. of Entom., for *Cænonympha Davus* read *Chortobius Pamphilus*.

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OBSERVATIONS UPON OUR PLANT-MINING AND GALL-MAKING DIPTERA AND HYMENOPTERA IN 1882.

By Peter Inchbald, F.L.S.

March 10th. — The deflected rosettes on small bushes of *Salix capræa* gave forth their tenants, which continued to emerge during the whole of the month of March. The gall-gnats bear considerable resemblance to *Cecidomyia rosaria* of the vertical rosette, which is fully a month later in putting on its wings. The deflection of the branches that bear the rosette is very remarkable, the stems sometimes offering the appearance of a loop. One bush gave me a score such deflected leaf-tufts, and not a single upright one was visible on the bush.

March 24th. — A hymenopteron (*Cryptocampus pentandræ*, Retz.) first emerged from woody galls of *Salix pentandra*, a somewhat local northern willow. The galls, which vary in size from a hazel-nut to an almond, contain about ten tenants, which exist as larvæ till the winter, pupating in the spring of the year. They continue to appear as imagines during March and April. According to Mr. Fitch the *Cryptocampus* is identical with the one described so accurately by Thomson. I bred nearly a hundred from the galls I had gathered before the winter.

March 26th.—*Cecidomyia betulæ* came forth in fair abundance from the catkins of the birch of the previous year. It utilises the winged seed as food and shelter, modifying it to its wants. The pupa is enclosed in a thin, white, papery case. The imago puts on wings between 7 and 8 o'clock a.m., if the morning be bright and sunny. I saw several emerge, and in about half an hour the transformation-scene is at an end. The termination of the oviduct of the little red gnat is white, as stated by Walker.

Like so many of the *Cecidomyidæ*, it is very lively in its movements.

March 29th.—Sent to Dr. Meade specimens of a miner of the Tartarian honeysuckle that came forth this day from its pupa in the mine, where it had remained inactive since July, 1881. Dr. Meade says, in a letter dated March 31st, "The little miner of the honeysuckle leaves appears to be an example (female) of the *Agromyza geniculata*, Fallen. Nothing is recorded of its life-history, and it is said to be rare."

March 30th.—A little *Cecidomyia* emerged from deflected rosettes of the true *Salix repens*. The rosettes or leaf-tufts are very small, but beautifully symmetrical. I can hardly consider it as identical with our old friend *C. rosaria*, though quite aware that it is apt to be modified by circumstances so far as size and contour. Another insect-problem that has yet to be satisfactorily solved!

April 25th.—The first gall-gnat, the true *C. rosaria*, emerged from the vertical leaf-rosettes of *Salix capræa*, upwards of a month later than the reputed *C. rosaria* that came forth from the deflected rosettes on the same species of willow.

May 4th.—Cecids emerging from the vertical (all) rosettes of *Salix alba*. Modification of the long narrow leaves of this species to the exigencies of the tenants. Reputed identity between the two imagines.

May 13th.—Bar-winged fly (*Trypeta cylindrica*, Desvoidy) bred from the seed-heads of *Centaurea nigra*. Feeds, according to Loew, on the seeds or receptacle of various Composites on the Continent. Pupa lies *loose* and exposed among the fluff, short and tufted, of the seeds.

May 31st.—Another gall-gnat (*Cecidomyia salicis*) coming from the woody branch-galls of *Salix cinerea*. The terminal and lateral branches are both galled, the gall appropriating the sap that should have supported the shoots, which frequently perish in their efforts to subsist. Dr. Meade remarks, in a letter to me, "This species is very similar to *C. rosaria*, but has a little tuft of white hairs over the mouth."

June 3rd.—Both *Cardamines* (*pratensis* and *amara*) giving evidence of their flowers serving as food to the larvæ of *Cecidomyia cardaminis*. Flowers distorted by the larvæ. Styles, stamens, sepals, petals, capsule, all showing the effects of their depredations. *Cardamines* so affected growing on wet and spongy ground. The white petals of *C. amara* assume the deep purple hue of *C. pratensis,* so that it is difficult to distinguish between the species except by the leaves. I am looking for the imagines to put in an appearance in April of 1883. Winnertz reared the little gall-gnat in 1853. After many fruitless attempts he says he reared forty-nine males and forty-six females.

June 4th.—Bedeguar Cynips (*Rhodites rosæ*) emerging very abundantly from the mossy tufts on the stems of *Rosa canina* of the previous year. Bred upwards of two score. Very few apparently were ichneumoned last autumn.

June 7th.—The tenants of the stunted acorns of *Quercus pedunculata* prove to be *Synergus evanescens.* Mr. Fitch kindly forwarded the insect, for more perfect recognition, to Dr. Mayr. It is thus *not* the original house-builder, but simply a tenant! Its habits of life are peculiar, and certainly need closer observation in England. I bred nearly a hundred of both sexes of the *Synergus evanescens.* The original builder is not known.

June 10th.—The tendrilled leaves of the pea mined artistically by the larva by *Phytomyza affinis,* Macquart, the *P. nigricornis* of Curtis. The pupa-case is imbedded at the end of the mine. I noticed the emerging of the imago from the mine very early in the morning. Wings long in expanding.

June 19th.—In January last Mr. Bloomfield kindly sent me, from the Sussex coast near to Hastings, dipterous wens that were obtained from the thistle (*Carduus arvensis*). These were tenanted by the pupæ of a Urophora (*Urophora Cardui*), as their markings distinctly showed. I put them into a glass-topped box, occasionally moistening them with water so as to assimilate Nature in her ways and means. Just before midsummer-day the tenants of the gall began to emerge. I bred fully fifty, with a large proportion of females.

June 21st.—Galled heads of the hardhead (*Centaurea nigra*) accompanied the thistle-galls, and these gave me an abundant progeny. I would remark that the economy of this bar-wing (*Urophora solstitialis*) differs from that of *Trypeta cylindrica,* which frequents the same flower-heads, inasmuch as the latter always pupates *without* any hard woody gall, the former invariably shrouds itself in a hard case, being the outcome of the seeds or receptacle.

June 29th.—Bred the beet-fly (*Chortophila betæ*) from another of the Chenopod family, the *Atriplex Babingtonii*, from Conway Bay, in North Wales. This makes the eighth representative of the clan that has yielded me the fly.

July 7th. — The mines of the snowberry-leaves (*Symphoria racemosa*) gave me the *Phytomyza nigricans* of Macquart in fair abundance. Weyenbergh, I believe, named this identical species *Harlemensis* about the middle of the present century, under the impression that it was a *nova species*, as it might be at that time. He remarks in his notice thereof that the larva, in feeding, left behind it a line of frass, much after the fashion of a *Nepticula* larva. This I found to be the case. The mines, which are conspicuous on the leaves of the shrub, are much contorted and white.

July 10th.—The leaf-mines of *Ranunculus repens*, and beautiful mines they are, yielded me *Phytomyza flava*, but not in any abundance. The pupæ are of a bottle-green colour. The larvæ pupated freely, creeping forth from the mine and attaching their pupa-cases to the sides and bottom of the glass-topped box. It is possible that the pupæ missed the necessary moisture, for the imagines only sparingly emerged. The flies are yellow in colour, and very restless.

July 21st.—"Onion flies" beginning to issue in some plenty from pupahood. The species that affected our onion-beds here is *Chortophila platura*. This fly was known to Goureau as affecting the shallots on the Continent. The larva gradually reduces the plants into a stinking mass. Pupates below the sod near the bulb, and puts on wings in due course. Dr. Meade, in a letter dated the 27th of July, states that he has bred from them two Chortophilas distinct from mine, viz., *C. cilicrura*, Rondani, and *C. varicolor*, Meigen. These facts show, he adds, "that the onion tribe is preyed upon by several species of *Anthomyiidæ*, so that none can be called *par excellence* the onion-fly."

July 24th.—Bred the beet-fly from another of the Chenopod tribe (*Atriplex triangularis*), found as a food-plant on the Sussex coast. This discovery, by Mr. Bloomfield, was briefly noticed in 1880, though the species of *Atriplex* was not truly named. The more I look into this beet-feeder and its food-plants the more I am convinced that it is not very particular as to the food-plant, if it savour of the Chenopod tribe.

July 26th.—Parasites bred from the snowberry-miner. They are named by Mr. Fitch *Colastes braconius*, Haliday. Brischke, he remarks, has also bred it from leaf-miners.

July 31st.—*Phytomyza albiceps*, bred from larvæ that fed on the ragwort (*Senecio jacobæa*), covering its leaves with its pretty white mines. It is one of the most polyphagous of the group, according to Scholtz and Hardy; Hardy, indeed, bred this fly from both ragwort and groundsel. It bears a close resemblance to *P. affinis*, and it may be, as Dr. Meade remarks, only a variety of that species.

August 1st.—*Cecidomyia veronicæ* emerging from the woolly leaf-galls of the speedwell (*Veronica chamædrys*). I bred this gall-gnat so early as September, 1860. I have noticed the *Veronica serpyllifolia* apparently galled by the same gnat as is *V. montana* on the Continent. The larvæ pupate within the pair of woolly leaves that terminate the stem.

August 4th.—Grubs of the "carrot-fly" (*Psila rosæ*) apparent in the affected roots. Larvæ worming the root and protruding from the tunnels made thereby. Larvæ all pupated within the soil before the 20th of the month. Noticed upwards of a score, which may give forth the imagines in September or remain in pupahood till the spring of next year. It would seem that several generations of this fly occur during the year. Pupa-case pale ochreous, with slightly darker tips. Smaller than that of the onion-fly.

August 5th.—Willow sawfly (*Nematus croceus*) put on wings. I found the larvæ feeding on the goat willow (*Salix capræa*) on the 4th of June. They pupated on the 10th, and the imagines began to put in an appearance at the close of July and beginning of August. The larvæ much resemble the gooseberry sawfly larvæ, but the colours are more bright and vivid. The imago is larger than that of the gooseberry-fly, and of a saffron-yellow. Vollenhoven figures it under the name of *N. trimaculatus*, a not inappropriate name.

August 23rd.—*Helichrysum* leaves mined by some dipteron. Mines have a great resemblance to those of *Phytomyza albiceps*, and I quite expect that it will prove to be that species, which is so truly polyphagous. I believe the species of *Helichrysum* is *bracteatum*.

August 28th.—Hatching of *Cecidomyia veronicæ* from another of our native speedwells (*V. serpyllifolia*). The larvæ feed between the thickened upper leaves and pupate therein. *V. serpyllifolia* is a smooth species, so that the nidus is free from the woolliness so visible in that of *V. chamædrys*.

Fulwith Grange, near Harrogate, Aug. 31, 1882.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

By John B. Bridgman and Edward A. Fitch.

No. III.—CRYPTIDÆ (*continued*).

Stilpnus, *Grav.*

A. Abdomen black; antennæ with seventeen joints.
 a. Trochanters black (female).
  Femora and tibiæ red; aculeus exserted, but very short. 2. *deplanatus*, 1¼ line.
 b. Trochanters red (males and females).
  * Legs red; coxæ more or less black. - 1. *gagates*, 1⅓—2 lines.
  ** Legs red. - - - - - - - 3. *pavoniæ*, 1¾ line.
B. Middle of abdomen red, sometimes black (females).
 a. Flagellum of antennæ 15-jointed. - - 5. *blandus*, 1⅓—2 lines.
 b. Flagellum of antennæ 14-jointed. - - 4. *dryadum*, 3 lines.

Gravenhorst, who described four species, placed this genus in the Ichneumonidæ, but remarked on its affinity to some of the smaller species of *Cryptus* and *Phygadeuon*, and to *Hemiteles*. Most recent authors, following Taschenberg, have included *Stilpnus* in the Cryptidæ, although it has not an exserted ovipositor. Haliday says: "This genus is more allied to *Hemiteles* than to any other Ichneumonidæ; the males of *Stilpnus*, and some species of *Atractodes*, are also very similar" (Curt., Brit. Ent., 388). In the 'Annals of Natural History,' Haliday described sixteen species of *Atractodes*, and of his *A. vestalis* writes: "This species might perhaps with equal reason be referred to the genus *Stilpnus*; indeed any definite line drawn between these two genera must be arbitrary" (vol. ii., p. 118; 1839). Thomson carries out these views when he unites *Stilpnus* and *Atractodes* in his tribe Stilpnina, which follows his Hemitelina (Opusc. Ent., 468). The species, which are difficult to differentiate, are not rare in Britain. *S. dryadum* is beautifully figured by Curtis (Brit. Ent., pl. 388), and is outlined in Vollenhoven's 'Schetsen' (pt. 1, pl. i., fig. 4). Unfortunately but little is known of the biology of this genus.

Mr. E. A. Butler bred one specimen of *S. deplanatus* from a silky white cylindrical cocoon, with an opaque white girdle round its centre, which was 3 lines long. The host was a lepidopterous larva, feeding on honeysuckle, collected in Brecknockshire. Brischke says that *S. gagates* is a parasite of *Anthomyia radicum.* The fact of a species being bred from a cocoon shows that the genus does not belong to the Ichneumonidæ.

PHYGADEUON, *Grav.*

SECTION 1.—Scutellum and abdomen black.

A. Antennæ entirely black (females).
a. Metathoracic areæ complete and distinct; 1st abdominal segment aciculate.
* Front legs black, hind ones partly chestnut; aculeus only just exserted. - - - - - 4. *flavimanus*, 3½ lines.
** Legs red, hind coxæ brown; aculeus about one-fourth of abdomen. 1. *caliginosus*, 2½—3 lines.
b. Metathoracic areæ not complete; legs red, hind coxæ darker; 1st segment partly aciculate; aculeus about one-fourth of abdomen. 60. *corruptor*, 2½—3 lines.
B. Antennæ red at the base, not white-ringed (females).
a. Metathoracic areæ complete and distinct.
Metathorax bispined; 1st and 2nd segments polished; femora and tibiæ red, apex of hinder blackish; aculeus nearly half of abdomen. - - - - 36. *afflictor*, nearly 3 lines.
b. Metathoracic areæ not complete and distinct.
* Coxæ and trochanters black; aculeus only just projecting. 41. *cephalotes*, 3⅓—3½ lines.

Note.—Gravenhorst says of the antennæ, "6–9 supra albidis"; but Taschenberg makes no mention of the whitish marks.

** Legs red; antennæ red-brown; aculeus half of abdomen. 59. *brevicornis*, 3 lines.
C. Antennæ white-ringed (females).
a. Metathoracic areæ complete and distinct.
1st segment aciculate; greater part of femora and tibiæ red; aculeus about one-fifth of abdomen. - 3. *nigrita*, 2⅔ lines.
b. Thoracic areæ not complete.
Coxæ red; aculeus rather more than half of abdomen.
* Inner orbits white. - - - - 61. *oviventris*, 3 lines.
** Inner orbits black.
‡ Hind tarsi pale-ringed. - - - *tarsatus*, 3—4 lines.
‡‡ Hind tarsi not pale-ringed. - - - 67. *fortipes*, 3½ lines.
a. Metathoracic areæ complete and distinct.
D. Antennæ black (males).
a. Metathoracic areæ complete and distinct.
* Supero-medial area broader than long, or as broad as long, hexagonal.
† All the coxæ and trochanters black.
‡ 1st segment of abdomen very broad and strongly keeled. 3. *nigrita*, 2½ lines.

‡‡ 1st segment much narrower and scarcely keeled.
4. *flavimanus*, 2⅓—2½ lines.
†† Front coxæ and trochanters pale, hind ones black.
62. *nycthemerus*, 3—3½ lines.
††† All the coxæ and trochanters whitish to pale yellow.
61. *oriventris*, 2¾ lines.
** Supero-medial area broader than long, almost semicircular.
1. *caliginosus*, 2⅓—2½ lines.
*** Supero-medial area distinctly longer than broad.
37. *cinctorius*, 2½ lines.
b. Metathoracic areæ not complete and distinct.
Metathorax with two cross lines: supero-medial area not closed at the sides.
* Hind tarsi not white-ringed. - 41. *cephalotes*, 3⅓—3½ lines.
** Hind tarsi distinctly white-ringed. - - *tarsatus*, 4½ lines.

SECTION 2.—Scutellum pale; abdomen black.

Female. - - 37. *cinctorius*, 3—3¾ lines.

SECTION 3.—Scutellum pale; abdomen red and black.

A. Metathoracic areæ incomplete (females).
Antennæ tricoloured; aculeus more than half the length of the abdomen.
a. Abdomen red, apex black. - 44. *congruens*, 3—4⅓ lines.
b. 1st to 3rd segments of abdomen red. 43. *graminicola*, 2½ lines.
B. Metathoracic areæ complete and distinct (males).
Supero-medial area never quadrate; middle of abdomen red; face white-marked.
a. Front coxæ dark.
* Metathorax without spines. - - 16. *cretatus*, 2¾ lines.
** Metathorax with very prominent spines. 22. *pumilio*, 2½—3 lines.
b. Front coxæ and trochanters pale. - 21. *larvatus*, 3½ lines.
C. Metathoracic areæ incomplete or indistinct (males).
Supero-medial area, if present, quadrate; face and mouth yellowish or pale-marked.
a. Antennæ white-ringed. - - - 44. *congruens*, 5 lines.
b Antennæ not white-ringed.
* Middle of abdomen red; tibiæ red, apex of hinder black.
† Front coxæ and trochanters pale. 53. *arridens*, 2½—3 lines.
†† Front coxæ and trochanters dark. 51. *jucundus*, 2½—4 lines.
** Middle of abdomen brown-red; base of hind tibiæ white (absent in a var.). - - - - - 56. *basizonus*, 3¼ lines.

SECTION 4.—Scutellum black; abdomen red or red and black.

A. Antennæ black (females); var. of *fumator* red at the base.
a. Metathoracic areæ complete and distinct.
* Abdomen distinctly narrower than the thorax, lanceolate.
14. *nitidus*, 2½—3 lines.
** Abdomen as broad as the thorax, oval.
† 2nd and 3rd segments of abdomen more or less red.

‡ Aculeus about one-fourth or one-third of abdomen. 8. *fumator*, 1¾—2 lines.

‡‡ Aculeus half of abdomen. - - 13. *pullator*, 1⅓—1½ line.

‡‡‡ Aculeus rather shorter than the abdomen. *speculator*, 2¼ lines.

†† 2nd to 5th segments red; aculeus half of abdomen. 17. *vagans*, 2 lines.

b. Metathoracic areæ incomplete.
2nd to 7th abdominal segments red. 48. *scoticus*, 3—3¼ lines.

B. Antennæ black, red at the base (females).

a. Metathoracic areæ complete.

* 1st abdominal segment distinctly aciculate.

† 2nd segment polished, at the most with very scattered punctures or aciculations.

‡ Aculeus about half of abdomen; legs red, or almost entirely so.

§ 2nd abdominal segment red. - *nanus*, 1¼ to nearly 1½ line.

§§ 2nd and 3rd segments red, 4th more or less so. 7. *rufulus*, about 2½ lines.

‡‡ Aculeus very short; middle of abdomen red. 6. *variabilis*, 2½ lines.

†† 2nd segment finely aciculate; aculeus about one-fourth of abdomen.

× Coxæ black. - - - - - - 33. *semipolitus*, 3 lines.

× × Coxæ red. - - - - - - - 12. *æreus*, 2 lines.

** 1st abdominal segment polished, or with very scattered punctures or aciculations.

† Middle and hind tibiæ not spined along the outside.

‡ 2nd and 3rd abdominal segments, and greater part of legs, red. 18. *ovatus*, 2½ lines.

‡‡ Abdomen red, 1st segment more or less black.

§ Aculeus at least one-third of abdomen.

× Hind femora red. - - - - 19. *bitinctus*, 2—2½ lines.

× × Hind femora more or less black.

o Legs red, greater part of hind femora black. 24. *plagiator*, 1¾—3 lines.

oo Tibiæ and apex of front femora red. 25. *erythrogaster*, 2 lines.

§§ Aculeus very short; legs red. - - 20. *exiguus*, 1⅘ line.

†† Middle and hind tibiæ with spines along the outside. 35. *vagabundus*, 3—4 lines.

b. Metathoracic areæ not complete.
Segments 1st to 4th, front femora and tibiæ, red. 42. *rufinus*, 3 lines.

C. Antennæ red-ringed (females).
Metathoracic areæ complete and distinct.

* 1st segment distinctly aciculate.
Middle of abdomen and legs almost entirely red. 7. *rufulus*, 2½ lines.

** 1st and 2nd segments polished.
Abdomen red, petiole black; tibiæ and apex of front femora red. 25. *erythrogaster* var., 2 lines.

D. Antennæ white-ringed (females).

a. Metathoracic areæ complete and distinct.

* Abdomen and legs red; petiole and coxæ black; hind and middle tibiæ spined outside. - - 35. *vagabundus*, 2½—3½ lines.

** Segments 2nd and 3rd and greater part of legs red; aculeus half of abdomen; apex of abdomen white - - *fulgens*, 3 lines.
b. Metathoracic areæ not complete and distinct.
* Metathorax so rough that the areæ are not distinct.
† Abdomen red; tibiæ partly white. 38. *parviventris*, 3—4 lines.
†† Segments 2nd to 3rd, femora and tibiæ, red; apex of hinder black. 39. *quadrispinus*, 3—4 lines.
** Metathorax not so roughened, more or less distinctly rugose.
‡ 1st and 2nd abdominal segments polished.
§ Abdomen red, petiole black.
× Inner orbits above the antennæ red. - 46. *errator*, 4 lines.
× × Inner orbits not red.
o Hind tibiæ red, apex black; legs rather stout. 47. *abdominator*, 2—3½ lines.
oo Hind tibiæ black, extreme base lighter; legs less short and thick. 49. *obscuripes*, 3½ lines.
§§ Apex of abdomen, and more or less of the 1st segment, black.
→ Coxæ black. - - - - - - 45. *curvus*, 3—4½ lines.
→→ Coxæ red. - - - - - - - *probus*, 2½—3 lines.
‡‡ 1st abdominal segment aciculate, 2nd finely reticulate.
Abdomen red, apex black, anus white, legs red; aculeus as long as the abdomen. - - - - - 63. *lacteator*, 3—3½ lines.

E. Antennæ tricoloured (females).
a. Metathoracic areæ complete and distinct.
* 1st segment distinctly aciculate.
Segments 2nd to 3rd and legs almost entirely red; aculeus very short. - - - - - 5. *dumetorum*, 2½—2¾ lines.
** 1st and 2nd segments polished, at the most with scattered punctures and aciculations.
† Abdomen red, petiole black.
‡ Middle and hind tibiæ with spines on the outside. 32. *profligator*, 2½—3½ lines
‡‡ Middle and hind tibiæ without spines. 26. *brevis*, 2—2½ lines.
†† Apex of abdomen black.
§ Legs entirely red. - - - - 27. *gravipes*, 2½ lines.
§§ Apex of hind femora and tibiæ black. 28. *improbus*, 2—3 lines.
b. Metathoracic areæ not complete and distinct.
* 1st segment not regularly punctured, with scattered punctures or indistinct aciculations, generally polished in front, and without any perceptible sculpture; 2nd segment polished, with now and then very fine scattered punctures.
† Metathorax with two transverse lines; supero-medial area not defined at sides. - - 28. *improbus*, var., 2—3 lines.
†† Metathorax with one or no transverse lines, the lateral areæ not subdivided.
‡ Metathorax polished.
Segments 1st to 3rd and greater part of legs red; aculeus half of abdomen. - - - - - 43. *graminicola*, 2½ lines.
‡‡ Metathorax more or less distinctly rugose.
§ Hind tibiæ red, apex black. - - 54. *Spinolæ*, 3 lines.
§§ Hind tibiæ white at the base, apex black. 56. *basizonus*, 2—3½ lines.

** 1st and 2nd segments densely and evenly punctured.
66. *erythrinus*, 2⅔ lines.
F. Metathoracic areæ complete and distinct (males).
a. Supero-medial area transverse.
* Supero-medial area hexagonal, not rounded in front or behind.
† Tibiæ white-ringed. - - - - 38. *parviventris*, 4 lines.
†† Tibiæ not white-ringed; abdomen red, petiole black.
‡ Middle and hind tibiæ spined outside. 35. *vagabundus*, 4 lines.
‡‡ Tibiæ not spined outside.
§ Legs stout, femora black. - - - 49. *obscuripes*, 4 lines.
§§ Legs slender, femora red. - - - 47. *abdominator*, 4 lines.
** Supero-medial area transverse, rounded at least in front.
× 1st and 2nd segments aciculate.
Greater part of abdomen and legs red. - 2. *rugulosus*, 2½ lines.
× × 2nd segment polished, not aciculate.
o Part of face and front coxæ white. - 15. *bifrons*, 2¼—2¾ lines.
oo Face and front coxæ black. - - - 17. *vagans*, 2 lines.
× × × 1st and 2nd segments polished. 34. *subtilicornis*, 2—2¼ lines.
b. Supero-medial area as broad as long, but never quadrate.
* Supero-medial area would be hexagonal, but for the bottom line projecting inwards in the form of an angle or bow.
† Mouth and inner orbits white. - 11, *jejunator*, 2½—3¼ lines.
†† Face black.
‡ The 3rd abdominal segment, only, red; legs dark.
10. *troglodytes*, 2 lines.
‡‡ 2nd to 3rd or 2nd to 4th abdominal segments red; legs vary.
§ 2nd segment very indistinctly aciculate. 6. *variabilis*, 2½—3 lines.
§§ 2nd segment not aciculate. - - 8. *fumator*, 1¾—3 lines.
** Supero-medial area hexagonal, with more or less blunt angles.
× Inner orbits white. - - - 56. *basizonus*, 2—3½ lines.
× × Inner orbits black.
o All the coxæ of the same colour.
+ Coxæ and legs red, or greater part red.
++ Coxæ not darker than the legs; base of antennæ generally red.
5. *dumetorum*, 2⅓—2⅔ lines.
++ ++ Coxæ darker than the legs. - - 8. *fumator*, 1¾—3 lines.
+ + Coxæ black.
∽ All the femora red or black. - - - - 8. *fumator* var.
∽∽ All the femora more or less browned; the hind ones, especially, very slender; 2nd to 6th segments red. 9. *tenuipes*, 3 lines.
oo Hind coxæ darker than the front ones.
Front and middle coxæ more or less red and white; hind ones black, or partly so. - - - - - 8. *fumator* var.
*** Supero-medial area pentagonal; 1st segment aciculate.
Middle of abdomen and legs partly red. 23. *ambiguus*, 3—3½ lines.
c. Supero-medial area distinctly longer than broad, in shape pentagonal or hexagonal.
† Inner orbits white.
* Metathorax with lateral spines; 1st segment with prominent spiracles. - - - - 64. *sperator*, 2½—3⅕ lines.
** Metathorax without lateral spines; spiracles of 1st segment scarcely perceptible. - - 63. *lacteator*, 2½—4 lines.
†† Inner orbits not white.

: Base of antennæ and back of middle abdominal segments red.

12. *æreus*, 2 lines.

:: Segments 2nd to 4th or 5th red; base of antennæ black.

65. *procerus*, 2½—5 lines.

G. Metathoracic areæ not complete or distinct (males).

* Metathorax very rough, so that the areæ are not distinct.

† 1st segment broad; apex of hind femora black; face and front coxæ white-marked. - - 39. *quadrispinus*, 3—4 lines.

†† 1st segment narrow; hind femora, face and front coxæ, black.

40. *senilis*, 2¾—3¼ lines.

** Metathorax not very rough.

a. Metathorax with two cross lines; the supero-medial area not closed at the sides.

Segments 2nd to 4th red,* or red with dark bands;** femora and tibiæ red, apex of hinder black.

* 2nd abdominal segment smooth. - 14. *nitidus*, 2¾—3¼ lines.

** 2nd segment distinctly punctate. - - *Marshalli*, 3 lines.

b. Supero-medial area not closed above, in form 4- or 6-angled; if closed above then somewhat quadrate, the upper lateral areæ often wanting.

* Legs marked with white.

† Front coxæ and trochanters white.

: Hinder coxæ black. - - - 68. *galactinus*, 2½—3 lines.

:: Hinder coxæ red. - - - - 28. *improbus*, 2—3 lines.

†† Coxæ and trochanters black.

§ Internal orbits, a line below the wings and ring of tarsi, white.

69. *subguttatus*, nearly 4 lines.

§§ Base of tibiæ and orbits white. - 56. *basizonus*, almost 4 lines.

** Legs not marked with white; middle of abdomen red.

× Clypeus and labrum whitish. - - 55. *labralis*, 3—4 lines.

× × Face not white-marked.

o Metathoracic spiracles almost linear.

50. *erythrostictus*, 4—4¾ lines.

oo Metathoracic spiracles round, or nearly so; supero-medial area subquadrate.

→ Greater part of hind femora black. - 52. *assimilis*, 3—5½ lines.

→ → Hind femora red, apex black. - - - 57. *sericans*, 3¾ lines.

c. Supero-medial area not closed below, which forms a long area from base to apex of the metathorax.

* Slanting part of the metathorax perpendicular. 70. *subtilis*, 2¼ lines.

** Slanting part of the metathorax forms a continuation of the upper part by a gradual slope.

Legs vary much in colour. - 71. *tenuiventris*, 2¼—2¾ lines.

SECTION 5.—Thorax more or less red.

Abdomen red, apex black, anus white-marked, antennæ white-ringed (females).

* Hind femora black.

† Head almost entirely red. - 30. *sanguinator*, 2½—3 lines.

†† Head almost entirely black.

: Metathoracic areæ complete and distinct. 29. *flagitator*, 2¼ lines.

:: Metathoracic areæ incomplete. - - 58. *tyrannus*, 3 lines.

** Greater part of hind femora red. - 31. *Hopei*, 2¼—2¾ lines.

NATURAL LOCALITIES OF BRITISH COLEOPTERA.

By Rev. W. W. Fowler, M.A., F.L.S.

No. VIII.—WATER COLLECTING (*continued*)—MOSS, HAYSTACKS, &c.

The *Philhydrida*, as a general rule, are common, and many of the scarcer species are very probably often passed over by collectors, in consequence of the resemblance they bear to commoner species. Many of the minuter groups, such as *Hydrænæ* and *Octhebii*, are best taken by scraping the mossy sides of pools and swamps with a net, having a metal rim, as described in last month's 'Entomologist.' The *Berosi* are not common, but may occasionally be taken in abundance; I found *Berosus affinis* very plentifully on one occasion in brackish pits in Lymington Salterns. The *Helophori* are a very unsatisfactory group, and want some one to work them out thoroughly; several species have lately been added to the British list, and very probably others remain to be discovered. *Hydrophilus* and *Hydrous* have already been mentioned as occurring in the London district; the former, in spite of its formidable appearance, is a vegetable feeder, and may be kept with safety in an aquarium with fish; its larva, however, is carnivorous, and very voracious. *Cyclonotum* is very common in some localities. *Chœtarthria* appears to be rather local, but may be obtained in damp moss in some abundance where it occurs. *Limnebius picinus* is very local, but abundant where it is found; *L. nitidus* seems to be rare. The other two species of the genus are common.

The *Elmides* and *Parnides*, although not usually classed with the water-beetles, cannot be mentioned in any other connection. The species of *Elmis* are found adhering to the bottom of stones under water, and require a practised eye to find them, as, at first sight, they look like so many little shapeless masses of dirt; *Elmis æneus* is the commonest species, and *E. Volkmari* the largest and most conspicuous. The rare *Macronychus* (first discovered by Mr. Harris in the Dove, near Burton) is always found attached to logs, and never to stones. In the same place I have found *Potaminus substriatus;* this beetle seems to be found almost always under clods of earth, near the bank, that have been dislodged and fallen into the water.

The very rare *Eubria palustris* may almost be called a water-beetle. The first British specimen was taken by the Rev. H.

Matthews, by sweeping in peat-pits, near Weston, Oxfordshire: although he tried the same place for some years, neither he nor the Rev. A. Matthews could discover another specimen, until one day, while searching the edges of a small ditch, about a foot broad and two inches deep, for *Leistus rufescens* (then considered a rare beetle), the latter collector happened to pull up some small sticks from the bottom, and on these he found *Eubria* in abundance. It seems never to be found except about the last week in July. *Hydrocyphon deflexicollis*, as its name (the water-cyphon) implies, is always found in swampy ground, if not actually in the water.

The water Hemiptera are well worth working at the same time with the Coleoptera. Many species, such as *Nepa* and *Notonecta*, the water-scorpion and water-boatman, are familiar to the most casual observer of pond-life. *Aphelocheirus* and *Mesomelia furcata* are very rare, and have never been taken in abundance, except by Dr. Power; the former appears only to be found in running streams. *Ranatra* is rather rare, but is found not uncommonly near London and Deal. The genus *Corixa* is very interesting, but very hard to work out at first: species are to be found in almost every pool and stream, and new ones often fall to the lot of any person who really works the genus; the points of distinction between the species, although in many cases small, seem to be constant, but it is a question whether we have not too many species, and whether some of them will not have to be merged into other species, as has already been done in one or two cases. The minuter water Hemiptera, *Plea*, *Cymatia* and *Sigara*, are usually found with the *Corixæ*, of which the species of the two latter genera are abridged likenesses.

The productiveness of moss on the edges of ponds has already been spoken of, but the half-submerged moss in and under waterfalls requires mention. It is under this that *Dianous cærulescens*, *Stenus Guynemeri*, *Quedius auricomus*, and the rare *Euryporus picipes*, are to be found. I believe that the very scarce *Homalota cærulea* has been found in Derbyshire in the same way, but I have never taken it. The *Elmides* seem to prefer stones in broken water or waterfalls. *E. subviolaceus*, for instance, occurs in profusion under a mossy waterfall, on the shore near Steephill, Ventnor.

To leave water-collecting altogether, we may say that moss in any locality is productive of good species. At all seasons of the year *Scydmænidæ*, small *Staphylinidæ*, especially *Tachypori* and

Homalotæ, *Trichopterygidæ*, and many others, may be obtained by shaking moss over paper; but it is in winter that moss collecting is most productive; the shelter that it affords is most attractive to numbers of species, and *Halticidæ*, *Curculionidæ*, *Coccinellidæ*, *Carabidæ*, and in fact species of almost any genera, may be found, although those above-mentioned are always the most abundant. Moss at the roots of trees is perhaps the best to gather, but *Sphagnum* in swampy ground will often produce many good species, and in moss off old walls I have found many scarce insects, such as *Cryptophagus pubescens*, *Scydmænus elongatulus*, *Homalota atricolor*, and others.

The following species, which have been recorded as taken in or under moss, will show the value of such collecting:—*Carabus intricatus* (many specimens in moss at roots of trees in Devonshire), *Lebia crux-minor*, *Platyderus ruficollis*, *Stenolophus flavicollis*, *S. dorsalis*, *Cœnopsis fissirostris*, *Trichonyx Maerkeli*, *Pselaphus dresdensis*, *Cephennium intermedium*, *Tachyporus formosus* (in abundance near Chiselhurst, by Rev. A. Matthews), *Tachyporus obtusus* var. *nitidicollis* (in abundance in Ireland, by Mr. J. J. Walker), *Gymnusa variegata*, *Lathrobium angustatum*, *Trichopteryx variolosa*, *T. brevipennis*, *T. dispar*, and many others of the best of the *Trichopterygidæ*.

In late autumn and winter the bottom layers of the heaps of dry leaves, that accumulate everywhere at the bottoms of hedges and in woods, are well worth working. My friend, the late Mr. Garneys, of Repton, was always most enthusiastic about this method of collecting, and certainly owed many of his best captures to it. I remember his telling me that Mrs. Garneys obtained one of the first British specimens of *Trichonyx Maerkeli* in this way. Many good species of the *Curculionidæ*, especially *Apions*, may be found at the bottoms of hedges by examining the dead leaves. It is not of much use, however, to search for *Trichopterygidæ* in dry leaves; they are exceedingly abundant, but will be found in almost all cases to consist of the very commonest species.

The large coarse tufts of grass that are to be found in almost every field are very productive if cut round with a sharp knife, lifted gently, and then inverted and shaken over paper. This is a very good method of collecting in winter, as it is almost certain to produce something, if all else has failed. Almost any beetle may be found in this way, as the tufts are favourite hybernating places; *Staphylinidæ*, however, especially *Steni*, are the commonest.

The damp bottom layers of haystacks afford shelter to numerous species, especially during the winter; my experience, however, of haystacks has not been a very good one, as I have found that *Atomaria ruficornis*, *Lathridius ruficollis*, and a few common *Homalotæ*, *Oligotæ*, and *Steni*, have usually made up the bulk of my captures There is no doubt, however, that in some localities there is nothing better worth working than a haystack. A little while ago I received two *Steni* from Mr. Bedford Pim, taken under a haystack near London, which turned out to be *S. asphaltinus*; and *Pseudopsis sulcatus*, *Heterothops quadripunctulus*, *Atomaria impressa*, several rare species of *Cryptophagus*, *Bolitobius inclinans*, and many others, have been recorded from such localities.

A collector, who wishes to adopt any of the four methods of collecting above mentioned, will do well to provide himself with a good-sized bag and a small sieve, about ten inches or a foot in diameter. The moss, perhaps, as it packs into a small space and is not easily shaken through, may be taken away bodily; but still in many cases the sieve is very useful, for dry moss especially; in dealing, however, with tufts of grass, dry leaves, or haystacks, the sieve is indispensable; the insects from a large mass may soon be shaken out through the sieve into the bag, and the whole of the shakings may then be conveniently examined at home at leisure. A small ordinary wooden sieve will of course suit the purpose, but it is far better to have the sides made of strong calico than of wood, and very much deeper; we shall then have a sort of bag with a net-work at the bottom, which will contain far more than an ordinary sieve, and can be shaken much more violently without any fear of losing the contents; it has, too, the great advantage of being easily carried, as it can be folded up flat.

As a conclusion for this article, we may perhaps consider birds'-nests, which should not be passed over when it is possible to examine them. *Cholevæ* may usually be found by shaking the nests over paper, and sometimes good species of *Histeridæ*. Pigeon's-nests have produced *Aleochara villosa*, *Homalium Allardi*, *H. florale*, and, I believe, *H. punctipenne*, *Ptinus fur*, *Niptus crenatus*, various *Cryptophagi*, &c. Sand martins' nests have been found to contain *Haploglossæ*. The very rare *Philonthus fuscus*, and the variety *coruscus* of *P. ebeninus*, have been taken from nests, and probably many other good species might be found if we knew in what kind of nests they might be looked for.

I have omitted one point, and that is that old thatch on and about houses should not be neglected. I have had no experience myself of this kind of working, but I believe that Dr. Power and other collectors have been very successful when they have tried it.

The School House, Lincoln, September 12, 1882.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

One day's Collecting in the Abbots' Wood district.—On Monday, May 29th, we had the pleasure of a day's ramble through the woods near Polegate, including the famous Abbots' Wood, on which occasion, by dint of hard work, we had the satisfaction to bag a decent number of lepidopterous larvæ, various imagos of the same order, and of the order Coleoptera. Taking Mr. South's hint, and thinking the "record of results" of one day's outing might possibly be worthy a corner in the 'Entomologist,' we have been induced to pen this. Commencing our operations, with a Bignell beating-tray, in the White Field, a couple of hours' work put us in possession of larvæ of the following species, viz.: — *Thecla quercus*, *Nola cucullatella*, *Lithosia complana*, *Liparis auriflua*,* *L. monacha*,* *Orgyia fascelina*, *Demas coryli*, *Pœcilocampa populi* (abundant), *Bombyx neustria*,* *Phigalia pilosaria*, *Nyssia hispidaria*, *Amphydasis prodromaria*, *Cleora lichenaria*, *Hybernia rupicapraria*,* *H. aurantiaria*,* *H. defoliaria*,* *Eupithecia virgaureata*, *Cymatophora diluta*, *Tæniocampa miniosa*, *T. gothica*, *T. munda*, *Scopelosoma satellitia*, *Cosmia trapezina*,* *Amphipyra pyramidea*, *Phycis roborella**; those marked with an asterisk were very common, as a matter of course. After luncheon, pushing on through the adjoining plantation, we struck the roadway to Hailsham, adding, meanwhile, to the list of larvæ, *Cymatophora ridens*, then very small. The imagines had now our chief attention, and up to about 5 p.m., when we had the pleasure of sighting "The Old Oak," we had captured thirty-eight species, the list being:—*Pieris rapæ*, *Anthocharis cardamines*, *Argynnis Euphrosyne*, *A. Selene*, *Vanessa cardui*, *Chortobius Pamphilus*, *Thecla rubi*, *Syricthus Alveolus*, *Thanaos Tages*, *Hesperia Sylvanus*, *Hepialus hectus*, *H. lupulinus*, *Lithosia rubricollis*, *Chelonia plantaginis*, *C. villica*, *Orgyia pudibunda*, *Venilia maculata*, *Odontopera bidentata*, *Tephrosia consonaria*, *T. extersaria*, *Iodis lactearia*, *Asthena candidata*, *Timandra amataria*, *Cabera pusaria*, *C. exanthemaria*, *Lomaspilis marginata*, *Emmelesia affinitata*, *Melanippe hastata*, *M. montanata*, *Cidaria corylata*, *Anaitis plagiata*, *Herminia barbalis*, *Scoparia ambigualis*, *S. mercurialis*, *Cryptoblabes bistrigella*, *Crambus pratellus*, *Penthina prunaria*, *Adela Degeerella*. After doing justice to Mr. Lambert's "home-cured," we again turned into the woods, our principal captures on the way back being *Ennychia octomaculalis* and some half dozen *Agrotera nemoralis* in good condition. We are indebted to Mr. G. Lewcock for naming the following species of Coleoptera taken on this occasion:—*Bradycellus verbasci*, *Gastrophysa polygoni*, *Malachias bipustulatus*, *Telephorus lividus*, *T. limbatus*, *Balaninus glandium*, *B. tesselatus*, *Polydrosus pterogonalis*, *P. cervinus*, *Cetonia aurata*, *Rhynchites cupreus*, *Dasytes plumbeo-niger*, *Anaspis frontalis*, *Lagria hirta*, *Athous hæmorrhoidalis*, *Malthodes sanguinolentus*, *Phyllobius pomonæ*, *Omosita discoidea*, with about half a score others, which are as yet unnamed. In addition to the above we boxed various species of Neuroptera, Homoptera, and Hemiptera; and ultimately arrived at Eastbourne, after our day's collecting, at about 11 p.m.—Oliver C. Goldthwait, Church End, Walthamstow; J. A. Clark, The Broadway, London Fields.

Chœrocampa elpenor Larva feeding on Enchanter's Nightshade.—I took lately at Farnham, Co. Cavan, a well-grown larva of *Chœrocampa elpenor* feeding upon the leaves of *Circæa lutetiana*, which it continues to eat ravenously in confinement. This is, I think, a new food-plant for this handsome Sphinx, the commonest of its tribe in Ireland.—Wm. Fras. de V. Kane; Sloperton Lodge, Kingstown, August 22, 1882.

Trichiura cratægi feeding on Poplar.—On August 17th I bred a small male specimen of *Trichiura cratægi* from a larva which I found in May last feeding on poplar. I have known it to feed on oak, birch, sallow, and blackthorn, but I have never found it on poplar before.—A. Thursall; Stratford, August 19, 1882.

Acronycta alni near Bristol.—While collecting in Leigh Woods to-day with Capt. Shelley, I was much pleased at finding a full-fed larva of *Acronycta alni* on sweet chestnut. This species has turned up in this neighbourhead singly for the last three years.—W. K. Mann; Clifton, Bristol, August 17, 1882.

Plusia bractea in Co. Clare.—At the end of July last, during a visit to Lisdoonvarna, Co. Clare, a specimen of *Plusia bractea* was brought to me, caught in the hotel where I was staying. This insect seems uncommon in Ireland. I think only three counties have yet been recorded where it has occurred, *viz.*, Wicklow, Kilkenny, and Sligo.—[Rev.] W. W. Flemyng; Portland, Co. Waterford, September 7, 1882.

Successful breeding of Nola centonalis.—I have again succeeded in rearing a fine brood of this delicate and variable species, from the eggs obtained at Deal, in July. They fed up well and rapidly, exclusively on clover flowers; they commenced hatching first week in August, and were full-fed and spinning up by the first week in September.—W. H. Tugwell; Greenwich.

Emmelesia blandiata in Surrey.—Whilst entomologising in Sussex on the South Downs, during July, I captured a specimen of *Emmelesia blandiata* in perfect condition, and evidently only just out. Some interest may attach to this fact, since my friend Mr. J. B. Hodgkinson, of Preston, tells me that this is the first known occurrence of the insect in question in the South.—[Rev.] H. T. Hutchinson; Whalley, Blackburn, Lancashire, August, 1882.

[Is our correspondent quite sure of his species?—Ed.]

Rarity of Lepidoptera.—I have been rather surprised at the unanimous accounts given by your correspondents, in the 'Entomologist' for August and September, of the great scarcity of Lepidoptera this season. Mr. Bradbury (Entom. xv. 192) goes so far as to report a "total failure"; and Mr. Prest, an old hand, calls it the "worst he ever remembers." I have been for several entomological excursions in different directions, and, although the greater number of both days and nights throughout June and July were most unfavourable for collecting, I found insects quite as abundant as ever before when the weather was favourable. Taking one species for instance, *Lithosia pygmæola*, which has been particularly mentioned as being "very scarce" this year (Entom. xv. 191), I found them in the very greatest profusion on the evening of July 15th. Mrs. Bird and myself boxing them as fast as it was possible. Other species, local and otherwise, I have also seen or captured in equal plenty on good nights; and, so far as my experience goes, I attribute the "scarcity," "failure," and what not, to the unfortunate proportion of fine weather.—G. W. Bird; Hurley Lodge, Honor Oak, S.E., August 14, 1882.

The bad season for Lepidoptera.—It will perhaps be of interest to some of your readers to know my experience of the present season with regard to Lepidoptera. I agree with your correspondents that the present is the worst season I have ever known, so far as number of species is concerned; but along with this fact is the curious and interesting one that some common species have been unusually abundant. Butterflies have been very scarce; I do not think that I have seen more than six species in this district during the whole season. The spring broods of *Pieris rapæ* and *P. napi* were plentiful, but not a single *P. brassicæ* was to be seen; *Satyrus Janira* has been by no means abundant; and these, with the addition of one specimen each of *Anthocharis cardamines*, *Vanessa Io*, and *V. urticæ*, about complete the list. Many species of moths, usually very abundant, have this year been scarce; but, on the other hand, the following have been swarming:—*Tortrix viridana*, many oaks were nearly stripped by this species; *Coccyx argyrana* in scores on the trunks of oaks; *Sciaphila subjectana* in thousands everywhere; *Argyresthia retinella* swarming in hedges. Besides these Micros some Macros have been very abundant:—*Chelonia caja*, sometimes as many as a dozen came to light in one evening; *Mamestra brassicæ* was unusually abundant; *Charæas graminis* has been more frequent than usual. I leave it to other entomologists to draw deductions from these facts.—H. H. Corbett; Ravenoak, Cheadle Hulme, Stockport, August 17, 1882.

Captures of Lepidoptera.—There appear to be very opposite reports from collectors as to their captures this season. I see from the August number of the 'Entomologist' that one correspondent has given up collecting as a bad job, another has rarely had such a bad season, whereas the next has taken rather more insects than usual. For my part the few Lepidoptera I have come across have appeared in large numbers. I spent the last two weeks of May at Shanklin, in the Isle of Wight, and never went out without seeing *Satyrus Megæra* flying in every lane and field; *Cœnonympha Pamphilus* and *Lycæna Icarius* were also quite common. A large bed of nettles close to the sea was quite black with thousands of *Vanessa urticæ* larvæ; I brought home a great many of these, hoping to get varieties, but they all appeared, in due course, of the normal type. I also took one specimen of *Venilia maculata*, a few of *Melanippe montanata*, and three good specimens of *Nola cristulalis*. *Pieris rapæ*, *P. napi*, *Acidalia imitaria*, *Hepialus lupulinus*, and larvæ of *Bombyx quercus*, *B. neustria*, *Odonestris potatoria*, also fell to my share in the Isle of Wight. In and near London I have found many larvæ of *Chelonia caja*, and every evening we have half a dozen or more *Boarmia rhomboidaria* moths flying round the drawing-room ceiling or into the gas, accompanied not unfrequently with specimens of *Ourapteryx sambucata*, several species of *Eupitheciæ*, and, on August 8th, *Cosmia trapezina*, though there are no oaks that I know of in the vicinity. Along the railway lines and fields at Willesden and Acton, *Camptogramma bilineata* and *Eubolia mensuraria* can be taken in large numbers; at one part *C. bilineata* was quite a nuisance, three or four rising out of the long grass at every step. I heard that *Hesperia sylvanus* had also been very common at East Acton along the railway bank. — CHAS. E. M. INCE; 29, St. Stephen's Avenue, Shepherd's Bush, July 11, 1882.

NOTES FROM THE ISLE OF MAN.—Seeing in the 'Entomologist' many complaints of the scarcity of insects during this season, I wish to offer a few observations on collecting in the Isle of Man. I have been accustomed to pay annual visits to the island, twice visiting it this season, but never saw insects in general more scarce. I went on June 2nd, intending to take the larvæ of *Sesia philanthiformis* and *Polia nigrocincta;* not a single specimen was to be seen of the former, and the latter was exceedingly rare, as I only took three, from which I reared one specimen, and of this the hind wings were crippled. On searching for *Polia nigrocincta* larva on the flowers of the sea-pink, *Statice armeria*, I was surprised to find, feeding on these flowers, *Triphæna orbona*, as well as *Epunda nigra*. I had taken *T. orbona* in the island before, feeding on foxglove. *Dianthœcia capsophila* and *D. cæsia* were on the wing, but not so numerous as I have seen them; and *Eupithecia venosata*, which I have also seen common, was very rare. I again went to the island on June 30th, and found *D. capsophila* larvæ feeding in the sea-pods of *Silena inflata* with *D. cæsia*, but, being rather late, it was scarce. *Setina irrorella*, which I have often taken, I did not see either journey this season. Other common species, which I have seen very plentiful, were as scarce; and I consider, on the whole, it has been a very bad season for collecting in the island.—JOHN THORPE; Spring Gardens, Middleton, near Manchester, September 12, 1882.

CAPTURE OF HARPALUS OBLONGIUSCULUS IN DORSETSHIRE.—It may interest your readers to know that I captured four fine specimens of *Harpalus oblongiusculus* in August last, beneath stones on the coast, near Portland.—[Rev.] O. P. CAMBRIDGE; Warmwell, Dorset, September, 19, 1882.

POLYSTICHUS VITTATUS, *Brullé*.—On July 15th I had the good fortune to find a specimen of this local species in a garden at Maidenhead. It was running swiftly in a dish of raspberries, and had doubtless come to obtain what moisture the fruit afforded. My friend, Mr. F. D. Donaldson, captured another specimen at Sydenham a few days ago, feeding upon treacle placed on a brick wall to attract Lepidoptera. The capture made at the latter locality is most interesting, although only a single example was taken, as it has never before been recorded from any locality so near London.—A. SIDNEY OLLIFF; 36, Mornington Road, Regent's Park, N.W., August 1, 1882.

MECINUS COLLARIS, *Germ*.—During the last week in August, while I was searching for insects along the coast, I observed some of the flowering stems of *Plantago maritima* very much swollen and discoloured; I brought home a handful, from which I have bred this little beetle. I was rather surprised to see the great variation in colour; the lightest were a dirty yellow, and all shades occurred up to black. Dr. Power, to whom I sent half a dozen (not two alike), had previously noticed this, and also remarked that Mr. Moncreaff had bred it in abundance about twelve years ago from the same plant, collected near Portsmouth (Entom. v. 451).—G. C. BIGNELL; Stonehouse, Plymouth, September 14, 1882.

HYMENOPTERA IN NORFOLK.—Aculeate Hymenoptera are fast becoming "extinct animals" in this county; after the very mild winter and warm early spring, I naturally expected to see the solitary bees swarming, but alas! I was doomed to disappointment.

I have walked hour after hour without seeing half a dozen specimens of *Halictus* or *Andrena;* I took a few males of *Andrena Smithella* on Easter Monday. I have not seen a single female specimen of *A. nigro-ænea*, *A. bimaculata*, or *A. combinata;* these are generally fairly abundant; the first one is very common. I have not seen more than half a dozen specimens of *Nomada*, and most of those were *N. ruficornis;* only one male of the genus *Megachile* or leaf-cutters, two or three *Osmia fulviventris*, and one solitary *Anthidium manicatum* are all I have met with. It is two years since I have seen a living *Cœlioxys*, the parasite of the leaf-cutters. The only exception to this dismal catalogue is the true wasps; in the spring the females were more abundant than usual, but up to the present time the neuters have been far from plentiful. Sawflies have been even worse than the Aculeates this year; I cannot remember that I have beaten a single fly into my umbrella this season, and I am quite sure that I have not yet seen a single specimen of *Tenthredopsis;* and many that are usually common have not put in an appearance. Ichneumons are almost as scarce; I have many a time beaten till tired for less than a dozen insects. I have been fortunate enough to breed both sexes of *Pezomachus vagans* from a spider's nest, and Mr. Bignell has bred the two sexes of another *Pezomachus.* I believe many species of *Hemiteles* and *Pezomachus* may still be reared from spiders' nests; I have bred three species of *Pezomachus* and three of *Hemiteles* from five different kinds of nests, one of which was even guarded by the female spider in a rolled-up nettle-leaf; I think many of the bred *Pezomachi* are lost in consequence of their small size allowing them to slip through the material that is used for ventilating the breeding-cases. I am afraid the above miserable experience is very general; all my correspondents make the same complaints. In the July number of the 'Entomologist' was a very interesting account of a parasite of *Dicranura vinula*, which the observer thought was *Paniscus testaceus;* I have had a great many of these parasites through my hands, and all were *P. cephalotes*, a very closely allied species, which has the head swollen behind the eyes; whilst in *P. testaceus* it slopes towards the neck, when seen from above; I think these parasites most probably are *P. cephalotes*, not *P. testaceus.*—JOHN B. BRIDGMAN; Norwich, July, 1882.

[The species bred by Mr. E. W. Andrews is Holmgren's *P. cephalotes.*—E. A. F.]

THE THRIPS OF THE FUCHSIA.—For some time past the leaves of our fuchsias have been attacked by two sorts of parasites: one of these belongs to the division of the Orthopters Pseudo-neuropters; to the genus *Heliothrips;* to the species *Heliothrips adonidum*, Haliday, or *H. hemorroidalis*, Bouché. This thrips lives on the lower sides of the leaves, of which it devours the outer surface; it is very destructive, and very difficult to destroy. Do your readers know anything about this insect? Have there been any publications on this subject, and in what papers?—E. LEFEVRE; 35, Place des Marchès, Rheims, France, August 9, 1882.

[We are not aware of anything authentic that has been written on this subject. Perhaps some of our readers can give information. Mr. Pergande's note (Entom. xv. 94) may interest our correspondent.—ED.]

NAPTHALINE.—The note on the use of napthaline for the protection of insect collections, in your July number (Entom. xv. 105), attracted my attention. I beg leave to state that I have used napthaline for over a year in my collections of eggs, mounted birds, bird skins, nests, and a general collection of insects. I have always had uniform success. I procure it in lumps, of a pale pink colour. I have never tried Mr. C. A. Blake's cones, for the reason that I am satisfied to let well enough alone. I hope to hear more on this subject.—ERASTUS CORNING, jun.; 22, Elk Street, Albany, N.Y., U.S.A., July 30, 1882.

NAPHTHALINE *versus* CAMPHOR.—Naphthaline is largely, I may say generally, used by foreign collectors. The Germans seem to have a very strong prejudice against camphor, as injurious to the specimens and also to the health of those who frequently breathe the fumes from their cases. I have for some years used naphthaline in the store-boxes which contain my collections, and have now entirely abandoned the use of camphor. I find the former most efficacious as a preventative. It will not cure an infected case: for this and quarantine purposes I use a few drops of bisulphide of carbon on cotton-wool, repeated once or twice at a few weeks' interval of time. This is fatal to all insect-life, but must be used with the greatest caution, as the effects of the fumes upon human life are most injurious. To prevent mould a small piece of cotton-wool on the head of a long pin, dipped in glacial carbolic acid and placed in the case, is a perfect remedy.—[Rev.] J. C. W. TASKER; Châlet Ketterer, Clarens, Vaud, La Suisse.

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ON THE EUROPEAN SPECIES OF THE GENUS *SMICRA* (CHALCIDIDÆ).

BY W. F. KIRBY,
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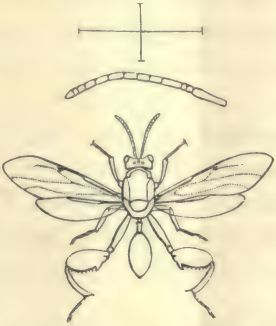

SMICRA SISPES, *Linn.*

THE genus *Smicra*, Spin. (originally misprinted *Smiera*, which is copied by many authors) includes the largest species of the subfamily *Chalcidinæ*, and may be recognised at once by its long petiole and enormous hind femora, armed with a row of teeth on the under surface. On examining the specimens in the British Museum I have found much confusion in the determination of the European species, and thought it might be useful to publish my observations without delay.

Five European species are on our lists at present, but the number is likely to be increased, as the *Chalcididæ* have hitherto been very little studied or collected. Of these, four are represented in the British Museum collection, three of which are in the British collection.

1. *Smicra myrifex.*

Sphex myrifex, Sulz.; *Chalcis sispes*, Fabr., Hübn., Panz., & Nees (but not of Linné); *Vespa dearticulata*, Fourcr.; *Smicra petiolatus*, Curt.; *Smicra nigrifex*, Walk.

Black, with yellow tegulæ and petiole, and the legs varied with black and yellow.

In the British Museum collection, from Paris, Munich, and Albania. Curtis states that it is "said to have been captured in the neighbourhood of London"; and Walker erroneously mentions two specimens from Georgia; these, however, were placed among the series of *S. sispes*, and in fact belong to a species allied to the latter, but perfectly distinct; they have nothing to do with *S. myrifex.*

2. *Smicra sispes.*

Sphex sispes, Linn.; *Chrysis sispes*, Fabr. (Syst. Ent.; but not of his later works); *Smicra sispes*, Walk., Curt.; *Chalcis clavipes*, Fabr., Panz., Nees; *Sphex fissipes*, De Vill.

Black; tegulæ ferruginous; legs varied with ferruginous; hind femora wholly ferruginous, except at the tip, which is black.

In the British Museum, from England, France, Munich, and Albania. This species stands in the 'List of British Animals: Nomenclature of Hymenoptera' as "*Smicra nigrifex*, Walk."

3. *Smicra microstigma.*

Smicra microstigma, Thoms.

Occurs in Sweden. I know nothing of this species beyond Thomson's description. It is said to be very similar to *S. sispes*, but the wings are less clouded and the thorax is less coarsely punctured.

4. *Smicra melanaris.*

Chalcis melanuris (misprint) and *melanaris*, Dalm.; *Smicra melanaris*, Thoms.; *Smicra Macleanii*, Curt.; *Chalcis biguttata*, Spin., Nees.

Black; knees, tarsi, and more or less of the tibiæ ferruginous; tegulæ, a spot towards the tip of the hind femora, and one on the outside, at the base, on which stands the outermost of two large teeth, white or yellow.

Two unnamed British specimens are in the Museum, from J. F. Stephens's collection; the species is also recorded from Sweden and Italy. After some hesitation, I have decided to regard *melanaris*, *biguttata*, and *Macleanii* as being probably synonyms of one species.

5. *Smicra* (?) *xanthostigma.*

Chalcis xanthostigma, Dalm.; *Spilochalcis xanthostigma*, Thoms.

Black, with yellow spots on the back of the thorax and on the legs.

In the British Museum, from England and Sweden. This species was confounded by Walker with the last, and is probably referred to as "*Smiera melanaris*, Walk.," in the 'Nomenclature of Hymenoptera.' It is the type of the genus *Spilochalcis*, Thoms., which is distinguished from *Smicra* by having a distinct spine at the end of the intermediate tibiæ, which is wanting in *Smicra*. The other species differ a little among themselves in the structure of the antennæ and hind femora, but hardly to a sufficient extent to make it desirable to subdivide them, especially as very little is yet known of the foreign species, which appear to be most numerous in South America.

The five European species may be tabulated as follows:—

A. Thorax black, unspotted.
  B. Petiole yellow. 1. *myrifex.*
  BB. Petiole black.
    C. Hind femora red, tipped with black.
      2. *sispes.* 3. *microstigma.*
    CC. Hind femora black, spotted with yellow or whitish.
      4. *melanaris.*
AA. Thorax black, with yellow spots. 5. *xanthostigma.*

Kirchner, in his 'Catalogus Hymenopterorum Europæa' (Vienna, 1867), enumerates six species of *Smicra*, as follows:—

1. *S. fulvescens*, Walk. England.
2. *S. melanaria*, Walk. England.
3. *S. nigrifex*, Walk. England.
4. *S. sispes*, F. (No locality given).
5. *S. subpunctata*, Walk. England.
6. *S. xanthostigma*, Dalm. Sweden, Vienna.

Nos. 2, 3, 4, and 6 require no further comment; *S. fulvescens* and *subpunctata* were described from the Island of St. Vincent (West Indies), which Kirchner seems to have imagined was in England.

CAUSES OF ABUNDANCE OR OTHERWISE OF LEPIDOPTERA.

By W. F. de Vismes Kane.

I hope the suggestions of Mr. South in your August number will be responded to in such a manner as will give an opportunity of investigating as fully as possible the causes which lead to the abundance or scarcity of Lepidoptera in different seasons. The present year seems to be one peculiarly suited for undertaking such an inquiry, as the scarcity everywhere complained of is undoubtedly more marked in some localities, and prevails more among certain species than others.

For the purposes of such investigation the paucity of workers in Ireland is much to be regretted, seeing that not only the climate possesses characteristics of its own, but that our summer and autumn weather of 1881 differed remarkably from that which prevailed in England, and was exceptional, Ireland having enjoyed more sunshine and less rain than usual, and the harvest here having therefore been unusually ample and well-saved, while I understand the contrary was the case in England. Observations in Ireland might, therefore, perhaps contribute in an important degree to our knowledge of the influences which favour or check the multiplication of lepidopterous insects.

I shall, for my own part, try to collect such information from any entomologist in Ireland with whom I am acquainted, and beg through the medium of your columns to appeal to any collectors in that country to oblige me with lists of their captures this year, noting the comparative scarcity or otherwise of particular species, together with as careful an analysis of the weather in each locality for the past eighteen months as is in their power to furnish.

I would also venture to suggest a few points which might be kept in mind by those who may undertake the investigation of the subject:—

1stly. Diurnal Lepidoptera, and such of the Heterocera as spin light cocoons or hybernate as larvæ above ground would, during a mild damp winter such as the last, fall an easy prey to slugs, beetles, woodlice, &c., whose rambles are stopped or checked by frost, snow, and low temperatures; whilst subterranean larvæ and pupæ would be unaffected thus. Hybernating ichneumons also might be expected to survive in proportionately larger numbers, but this would only affect the crop of Lepidoptera this autumn or next spring.

2ndly. The prevalence of extremely high winds last year and the early part of 1882 might be expected to destroy arboreal larvæ, whilst those of the marshes, or such as feed on low-growing herbage, would be little or not at all injured.

3rd. Heavy summer rainfalls would, as well as violent hail, act in precisely a similar manner, but I cannot help thinking that the cause that has operated most disastrously in the present season, at least on a portion of our entomological fauna, is the warm and sunny weather which forced on the vegetation early in spring, which was succeeded by a bitter and withering frost, keen enough, as I noticed, to blight the young leaves and sprouts of ivy, and which I believe prevailed very generally over the United Kingdom.

I need scarcely advert to the influence exercised by the weather upon the success of the entomological captures, an influence which is often inexplicable, that of wind, however, being excluded.

At the Isle of Man I learnt that scarcely any *Dianthœcia cæsia* or *D. capsophila* have been taken at Douglas Lighthouse this year, owing to the prevalence of high winds; but the capsules of the *Silene* in that neighbourhood bore witness to the ravages of an abundant supply of *Dianthœcia* larvæ.

In May and June I myself experienced the potency of atmospheric influences on the flight of nocturnal Lepidoptera, taking scarcely any during the last week of May, until, a change occurring, I filled my setting-house in a few nights with an abundant supply, whose numbers, both individually and in variety of species, surpassed my previous experience. Throughout June there was no lack of insects in such parts of Ireland as I have worked, but July and August have proved exceedingly barren, especially as to forest insects; though I can scarcely complain of such ill-success as seems to have befallen many brethren of the net in England.

In conclusion I wish to point out that if any records are available it would be very interesting to examine also what results were found to follow the abnormal weather of 1878 and 1879. The summer of 1878, following a mild damp winter, was warm and pretty sunny, while the succeeding winter of 1878–79 was like that of 1879–80, exceedingly severe and cold; whilst the summer of 1879 was characterised by little sunshine and low temperature. These characteristics seem to have been almost universal throughout the United Kingdom, with only local exceptions.

Sloperton Lodge, Kingstown, September, 1882.

NATURAL LOCALITIES OF BRITISH COLEOPTERA.

By Rev. W. W. Fowler, M.A., F.L.S.

No. IX.—DUNG, DEAD BIRDS AND ANIMALS.

We now come to the most disagreeable part of Coleoptera collecting; and yet, unless a collector makes up his mind to reconcile himself to it, he may as well give up collecting altogether. It is well known how quickly dung, dead birds and animals, and offal of all kinds, disappear if left to themselves; although a great part of the work of removing these is performed by flies, yet the beetles take a great share in the accomplishment of the useful work. The large *Necrophori*, or burying beetles, are known to the most casual observers; the whole of the *Scarabæidæ*, which form the bulk of the Lamellicorns, the great majority of the *Staphylinidæ*, most of the *Histeridæ*, all the *Silphidæ*, very many of the *Nitidulidæ*, *Trichopterygidæ*, and other groups are necrophagous, that is, feed on dead or decaying animal matter. These beetles are the scavengers of Nature, and we can better understand the reverence paid by the Egyptians to their huge *Scarabæi*, of which we so often find representations in the mummy-cases, when we remember how quickly they remove ordure and offensive substances from the ground; many of these beetles deposit their eggs in a ball of dung, and roll them in the sand until they have hardened into a regular cocoon; the young larvæ, when hatched, find abundance of their natural food around them, and when this is consumed they are just ready to turn into the pupa state, and soon emerge as perfect beetles from their cases; it is very easy, then, to see what an important part they play as sanitary authorities in tropical countries where such matters are entirely neglected.

The ancients were well acquainted with the dung beetles; we have one of the first records of Coleoptera in Aristophanes' "Pax," where he opens the play by describing two attendants as feeding one of these beetles with his usual food, and expressing great surprise at the way he rolled it up. We have not, however, space to dwell upon these parts of the subject, and must turn to our British species; many of our beetles simply burrow in dung, but some, like *Copris* (our only true *Scarabidæ*), *Geotrupes*, &c., make holes, and deposit their eggs enveloped in a mass of dung at the bottom, thus helping indirectly to manure the ground. *Copris* is a decidedly rare beetle, but may be found in some abundance near Richmond; the species of *Geotrupes* are, as a rule, very common, and often cause much annoyance by dashing up against people on summer evenings in their blundering flight.

If any person wishes to work dung and such like localities without any risk of contamination, the best plan is to throw the droppings into a pail of water, when the beetles rise to the surface, and may be easily secured; this plan is, however, only feasible when we are near home. An ordinary fern-trowel is very useful, and might be supplemented by a pair of insect-forceps, which would serve perfectly to pick up the insects with, as they mostly have strong integuments.

Fresh dung is of very little use, except for an occasional rarity settling upon it, like *Emus hirtus,* which may occur once in a lifetime; it is of more use to the lepidopterist as an attraction for *A. Iris* than to the coleopterist. After it has partially dried, however, it will be found to contain numberless species; many of these are found in hot-beds, but these have before been noticed.

The beetle that usually attracts notice on half-dried cow-dung is *Sphæridium scarabæoides,* which basks on the top in the sun, but disappears on a slight alarm. *Cercyons* swarm both in cow- and horse-dung; these are necessarily classed with the *Hydrophilidæ*, from which they cannot well be separated; but by their broad mentum and distant labial palpi they come so close to the *Leptinidæ* and *Silphidæ* that they might easily, and perhaps more naturally, be placed with them. *Cercyons* and *Histers* are usually considered to be exceedingly hard to set, but if taken when properly relaxed they are very easy; if any difficulty is found they may be set on their back in thick gum-arabic, and, when they have quite dried, their legs may be brushed out; a little jerk will then turn them over, and they may be gummed down, and the gum-arabic that remains on their backs may be washed off with benzine or spirits of wine. This applies to all the small globular beetles. No forcing will set the legs of *Histers*, but they may be easily coaxed, if their natural direction is followed.

The *Aphodii* are another group that are hardly ever unrepresented. Some of the species are very common; some, however, are rare, but occasionally turn up plentifully. Mr. T. Wood and Mr. Bedford Pim last year found the rare *Aphodius porcus* in profusion near London; the rarest species appears to be *A. scrofa*, of which one example has occurred near Southport. Among other rare species we may mention *A. Zenkeri*, taken in numbers by Dr. Power at Mickleham; *A. lividus*, recorded from Darenth Wood; *A. consputus* from Kent; *A. quadrimaculatus* from Coombe Wood; and *A. nemoralis* from Rannoch. *A. fœtidus* has been taken in some numbers near Manchester by Mr. G. Chappell and others; and *A. Lapponum* is very common in Scotland. *A. nitidulus*, *A. rufescens* (with a curious dark variety), and *A. scybalarius* are common near the sea-shore in some localities.

The *Onthophagi* do not seem to be altogether dung-feeders, as their name seems to imply, as they may also be found in dead birds and animals; the scarcest species, *O. taurus*, is doubtfully indigenous. Most of our species come from the Channel Islands; the other species, except perhaps *O. nutans*, seem to be common in many districts.

The same remark applies to the *Philonthi*, and in fact the *Staphylinidæ* in general; it would take too long here to attempt to discuss the species of this large group that are found in dung or dead animals; no collector can even pretend to get a collection together without attending carefully to the species thus found.

Of the *Histeridæ*, the *Saprini* are usually to be found under dung. I once took the rare *Saprinus immundus* in some numbers near Hunstanton, Norfolk, and with it *S. metallicus* and *S. maritimus ; Saprinus virescens* has been recorded from Swansea. The *Histers* proper are found sometimes in dung, sometimes in dead birds and animals, and sometimes in fungi ; one or two, such as *Hister bimaculatus* and *H.* 12-*striatus*, seem usually to occur in hot-beds ; some of the *Histeridæ* are rotten-wood feeders, while one or two are parasitic in ants' nests ; so they are rather a ubiquitous family. Some of the larger species may almost always be found under dead birds, especially in woods. A gamekeeper's-tree, with vermin nailed to it, in a wood, is said by Mr. Rye to be the luckiest thing to find ; out of a dead hedgehog suspended to a bush I one day beat quite a hail of *Choleva fumata* and *Homalia.*

I have, however, found birds on the ground most productive, especially a dead rook in the spring, if placed in a hole under trees and covered lightly with moss and grass ; such a trap will last for weeks, and quite set up one's collection, especially as a beginner, with *Cholevæ*, *Philonthi*, *Aleocharæ*, *Atomariæ*, *Nitidulidæ*, and many other species. *Tachini* are best obtained in this way ; one of the few specimens of *Tachinus rufipennis* recorded as British was taken from a dead grouse on Kettlewell Moor, Yorkshire ; and a great number of very good species have thus been obtained on the Scotch moors.

It is as well to remember that species of the genus *Necrophorus* should be collected from birds and small animals, and not from larger subjects, as, if so collected, they have no perceptible odour, if well-dried ; as the species are almost all common, this note is worth observing : with *Histers* and smaller beetles it makes no difference.

Dry fish thrown up upon the shore, above high-water mark, should not be passed over ; many good beetles, especially *Aleocharæ*, are found under them. *Creophilus maxillosus* is always abundant in such localities, and the variety *ciliaris* is well worth looking for.

The species of the genus *Silpha* are to be found in all places where there is high game to attract them ; with the exception of *S. dispar* and *S. reticulata*, they are not uncommon. The rare *Sphærites glabratus* is found near Rannoch in dry dead animals, and in dung.

The species of *Dermestes* are also, more especially in the larval state, necrophagous; the beetles themselves may be found in dry dead animals, as also in skins, as their name implies. Stephens (Illust. iii. 123) records the capture of a considerable number of specimens of *Dermestes tessellatus*, both in the larva and imago states, in an oyster on the beach off Shoreham, in Sussex; he also mentions the fact of having seen many ship-loads of hides from Brazil infested with *D. vulpinus*, which he concludes not to be an indigenous species.

The *Trogidæ* are fond of old horns, and may be found in abundance among them, together with *Omosita*, and other kindred species; they are also found in dead animals. *Trox hispidus* is extremely rare; *T. sabulosus* is not uncommon in some localities; *T. scaber* is the commonest species, and it appears to be occasionally found in decaying wood, as well as in its usual habitats.

Carabidæ, and species of other genera that are not truly necrophagous, are often found with the beetles above mentioned, perhaps attracted by the abundance of their living prey, but apparently themselves too ready to take part in the feast; it well known how freely large *Carabidæ* come to sugar, so that it is evident that they are not discriminating in their tastes.

The School House, Lincoln, October 16, 1882.

THE MACRO-LEPIDOPTERA OF THE ISLAND OF ARRAN.

By J. Jenner Weir, F.L.S., F.Z.S.

From the latter end of April till the middle of August Mr. M'Arthur was this year collecting Lepidoptera in the Island of Arran; and as he has kindly permitted me to inspect the captures thus made, I am able to offer some observations on the Macro-Lepidoptera of this hitherto little-known island.

The geology of the island is very varied, more so than any other part of the British isles of equal extent; but as I am not able to ascertain on which particular formation the insects were captured, that part of the subject must be left undealt with.

The following butterflies were seen or taken, *viz.*:—

Pieris brassicæ.
,, napi.
Argynnis Aglaia.
,, Selene.
Vanessa urticæ.
Satyrus Semele.
Satyrus Janira.
Chortobius Davus.
,, Pamphilus.
Thecla rubi.
Polyommatus Phlæas.
Lycæna Icarus.

Unfortunately Mr. M'Arthur took specimens of *Pieris napi* during the early part of his visit only, and neglected to take those of the summer emergence, so that I remain ignorant as to the appearance of the latter, but they were seen in some abundance; the specimens taken scarcely vary from the spring form of the insect as usually seen in the South of England, but they appear to me to be a shade darker in colour in the male, and the female has the venations of the wings darker than those of any I possess.

The specimens of *Lycæna Icarus* are very brilliant in colour, almost approaching to that of *L. Adonis*, and are larger than any southern-caught specimens I have seen.

The remainder of the butterflies taken do not call for any remark.

The *Sphingidæ* are not well represented, but two species were seen, *viz.*:—

Smerinthus populi and Macroglossa stellatarum.

The Bombyces are better represented. The following species were captured, *viz.*:—

Hepialus hectus.
,, lupulinus.
,, sylvinus.
,, velleda.
,, ,, v. carnus.
,, humuli.
Euthemonia russula.
Chelonia plantaginis.
Arctia fuliginosa.
Bombyx rubi.
,, quercus.
Saturnia carpini.

It is worthy of remark that, within so contracted an area as Arran, the whole of the British species of the genus *Hepialus* were taken; the females of *H. hectus* are very fine; *H. sylvinus* rich in colour; and *H. velleda* as beautifully marked as those from the Shetland Isles; but *H. humuli* in no way approaches the variety *Hethlandica* in the males, but the females have the upper wings of a very rich buff, with bright red markings, and the under wings beautifully suffused with rose-colour.

The following twenty-eight species of Noctuæ were taken, *viz.*:—

Leucania impura.
Charæas graminis.
Mamestra furva.
Grammesia trilinea.
Caradrina cubicularis.
Rusina tenebrosa.
Agrotis exclamationis.
,, porphyrea.
Triphæna pronuba.
Noctua C-Nigrum
,, festiva.
Tæniocampa gothica.
,, rubricosa.
,, instabilis.
Dianthœcia conspersa.
Phlogophora meticulosa.
Euplexia lucipara.
Hadena adusta.
,, glauca.
,, dentina.
,, oleracea.
,, pisi.
Anarta myrtilli.
Plusia V-aureum.
,, gamma.
,, interrogationis.
Stilbia anomola.
Phytometra ænea.

One of the specimens of *Tæniocampa instabilis* is nearly black, but upon the whole the Noctuæ of Arran closely resemble those of the mainland of Scotland.

The following fifty-two species of Geometræ were captured, *viz.*:—

Rumia cratægata.
Venilia maculata.
Angerona prunaria.
Metrocampa margaritata.
Selenia illunaria.
Odontopera bidentata.
Boarmia repandata.
Dasydia obfuscata.
Ephyra porata.
,, pendularia.
Asthena candidata.
Venusia cambricaria.
Acidalia immutata.
Timandra amataria.
Cabera pusaria.
Scodiona belgiaria.
Selidosema plumaria.
Fidonia atomaria.
Ligdia adustata.
Lomaspilis marginata.
Larentia didymata.
,, cæsiata.
,, pectinitaria.
Emmelesia affinitata.
Eupithecia venosata.
,, pulchellata.
,, satyrata.
,, castigata.
,, nanata.
Thera variata.
Ypsipetes impluviata.
,, elutata.
Melanthia ocellata.
Melanippe tristata.
,, rivata.
,, montanata.
,, galiata.
,, fluctuata.
Anticlea rubidata.
Coremia minutata.
,, propugnata.
,, ferrugata.
Camptogramma bilineata.
Lobophora lobulata.
,, polycommata.
Cidaria corylata.

Cidaria immanata.	Cidaria populata.
,, suffumata.	Eubolia bipunctaria.
,, silaceata.	Anaitis plagiata.

Most of the Geometræ mentioned in this list present but little, if any, variation from the normal coloration of the species, but a few call for some remarks. *Boarmia repandata.*—This occurs sparingly, and the colour in no way approaches that of the variety *Sodorensium. Ypsipetes elutata.*—There appears to be in Arran two races of this insect : one of the usual size and colour of the southern varieties, and the other the small and dark northern variety; the former inhabits the low grounds and feeds on the sallow, the latter is found higher up in the mountains and apparently feeds on the heath. I have little doubt but that the insects of Arran are very varied, its geological formation consisting of such different strata as Devonian, Lias, Oölite, Silurian, Granite, and other rocks. *Larentia pectinitaria.*—Particularly large and richly coloured. *Melanippe fluctuata.*—Very dark, and much suffused with black. *Cidaria immanata.*—A most interesting series of this species was taken, although there is some range of variation, yet the prevailing colour of all is greyish; in fact at a little distance they could scarcely be distinguished from the *Cidaria russata* taken in the Outer Hebrides. It is remarkable that *C. immanata* has been taken in Shetland and Arran; in the former islands the insect—unlike those of Arran—exhibits a prevailing reddish hue, but in neither of these islands, so far as I know, does *C. russata* occur; but in the Hebrides it does not appear that *C. immanata* has hitherto been found, *C. russata* only.

I have taken great care to verify the above singular case of geographical distribution, and I trust that future investigation will throw more light on the subject.

These expeditions to the remote islands of Scotland are not undertaken without great sacrifice of comfort, and are attended with risk to the health; and I regret that Mr. M'Arthur was seriously ill during his visit to the Hebrides in the early part of this year, or I have no doubt he would have added to our knowledge of the Lepidoptera of those islands.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

Lepidoptera observed in Surrey. — Observing in this month's 'Entomologist' that reference is made to the scarcity or total failure of imagos of Lepidoptera during the present season, even in the case of some of the commonest and most widely distributed species, I send the following list of species, which I noticed to-day whilst walking between Witley and Farnham, by way of Thursley and Elstead. The following species were very abundant, viz., *Satyrus Janira*, *S. Tithonus*, *S. Megæra*, *Hesperia linea*, *Pieris brassicæ*, and *P. rapæ*. I saw numerous examples of *Vanessa urticæ*, *V. Io*, *Satyrus Hyperanthus*, *S. Ægeria*, *Chortobius Pamphilus*, *Pieris napi*, and *Polyommatus Phlæas;* and single specimens of *Argynnis Paphia*, *Gonepteryx rhamni* (male), and *Lycæna Alexis*, the scarcity of the last-named being remarkable. At one point *Satyrus Semele* was abundant flying along, and alighting upon, a rough bank at the edge of a wood, which was covered with *Calluna vulgaris* and *Erica cinerea*, with occasional patches of *Erica tetralix;* but I did not see a single specimen of this species on any of the commons which lie between Witley and Farnham: though a few years since, and I suppose in most seasons, it was to be seen flying over the commons between Milford and Hindhead, and in fact for miles round Guildford, wherever occurs the rough and broken ground, covered with the above three species of heather, in which this species seems to delight.—George W. Oldfield; 48, Beaumont Street, Devonshire Place, W., August 7, 1882.

Lepidoptera near Portsmouth.—On the 28th of July there hatched in my breeding-cage a male var. of *Lasiocampa quercus*. The colour is deep chocolate, with the usual white spot in the centre of the fore wings; the stripe across both pairs of which is narrow and of a deep green colour, and the fringe of the under wings is the same colour as the stripe. The larva was black, with the usual white markings; the cocoon was also black. In Stakes Wood, on the 7th of this month, I took a specimen of the larva of *Stauropus fagi* feeding on birch; it died on the 11th. This summer Mr. Larcom and I reared a specimen each of *Smerinthus populi* with a mauve-pink tinge to the wings. Several specimens of *Acherontia Atropos* have been taken here and at Gosport. Four years ago Mr. Larcom took a specimen of *Sphinx convolvuli* at the Gosport Railway-station; he also captured a pair last season at his residence in Shaftesbury Terrace.—W. V. PEARCE; 42, St. John's Street, Buckland, Portsmouth, August 21, 1882.

LEPIDOPTERA IN THE FENS.—Although this year Lepidoptera are somewhat scarce in this neighbourhood, yet we have met with a notable exception or two. *Papilio Machaon* literally swarmed early in July, at Wicken Fen, Cambs. We captured a dozen in half an hour, and continued to net them at about the same rate for half a day. The man who lives near the Fen, to superintend the draining machinery, also says that they were abundant, and he often keeps the larvæ in his engine-room, which turn to chrysalids in the autumn and into butterflies at irregular periods during the winter commencing from early in December. The larvæ of *Anticlea badiata* and *A. derivata* were exceedingly common on the dog-rose bushes in June. We obtained a large number by the usual method of beating the bushes over an umbrella.—HERBERT E. NORRIS; St. Ives, Hunts, October 9, 1882.

NOTES ON LEPIDOPTERA IN WALES.—Having read in a recent number of the 'Entomologist' about the scarcity of Lepidoptera this year, I give a brief account of my own experience this season, as it may interest some of your readers. The only butterfly of note that I captured was a fine specimen of *Apatura Iris,* the only one I have seen this year, on June 13th, at Portmadoc; it was feeding on a dead water-rat. The only Nocturni of note were three specimens of *Smerinthus ocellatus*, all males. The total absence here of *Pieris brassicæ* and *P. napi* is a striking fact, as there were plenty to be caught and seen last year. I have also from this place the following:—*Pieris cratægi*, *Vanessa C-album*, *V. Atalanta*, *Argynnis Aglaia*, and *Hesperia Paniscus.* The above amount to all my collection this season, except an *Agrotis Ashworthii* which was presented to me by a friend. The same story comes from most of my friends and the members of the Field Club over which I preside, many members having given up collecting in despair. I may also state the total failure which I experienced in larvæ and pupæ hunting, being rewarded by one pupa of *Endromis versicolor.* The only butterfly that was seen in any quantity was *Argynnis Euphrosyne.* My breeding-cages have been empty all through the season. Altogether the additions to my collection, to compare with last year, amount to nothing. It is very disheartening, especially to a hard-working entomologist. I agree with your York correspondent in the July number of the 'Entomologist' as to the cause of the scarcity of Lepidoptera.—R. W. Hughes; 24, Church Street, Blaenau, Festiniog, N. Wales.

Lepidoptera in Aberdeen and Kincardineshire.—Insects in this part of the country have been exceedingly scarce this season, especially at sugar, only a very few of the more common species putting in an appearance. In the month of May scarcely an insect was to be seen at sugar, however fine the weather. June was somewhat better, but the insects which in former years used to come to sugar in great abundance, such as *Cymatophora duplaris*, *Acronycta menyanthidis*, *Hadena adusta*, and *H. rectilinea*, I could only find about half a dozen of each this season, although I sugared three or four times a week; and in July could only find *Triphæna orbona* and *T. pronuba*. Along the coast of Kincardineshire in July I had more success. *Argynnis Aglaia*, *A. Selene*, *Satyrus Janira*, *Lycæna Alexis*, and *L. Artaxerxes* were fairly common, but the usually common *L. Alsus* were not to be seen. *Hepialus lupulinus*, *H. velleda*, *H. humuli*, *Zygæna filipendulæ*, and *Lithosia complanula* were by no means scarce. Of *Dasydia obfuscata* only a few, but in fine condition. *Plusia bractea* last year turned up about the end of July, but as yet has not been seen. Larvæ seem to be more abundant: *Trichiura cratægi*, *Bombyx callunæ*, *Saturnia carpini*, *Dicranura vinula*, *Notodonta dictæa*, *N. ziczac*, *Acronycta menyanthidis*, and *A. myricæ* were quite plentiful. One curious fact I should like to mention regarding *Plusia interrogationis* larvæ. On May 27th I took about a dozen of the above larvæ, and, strange to say, only got one single imago, all the others being filled with ichneumon larvæ; while in former years I scarcely ever failed in rearing them.—J. Mundie; 22, Watson Street, Aberdeen, August 4, 1882.

Lepidoptera in Scotland.—Observing the different reports of collectors on the scarcity of Lepidoptera this season, my experience at Dollar, near Stirling, and also in the neighbourhood of Edinburgh, may perhaps be interesting to some of your readers. Butterflies have all the season been very scarce; even *Pieris rapæ* and *P. brassicæ*, which are generally very numerous in these districts, have been unusually rare. *Calocampa exoleta*, *C. vetusta*, *Hadena pisi*, *H. oleracea*, *Triphæna orbona*, *T. janthina*, *Charæas graminis*, *Agrotis nigricans*, *Hydræcia micacea*, and *Xanthia cerago* have come very plentifully to sugar. *Triphæna pronuba*, *Xylophasia polyodon*, *Agrotis tritici*, and *Plusia gamma*, in comparison with last season, have been scarce. *Cidaria miata*, *Thera variata*, and *T. firmata* have been decidedly plentiful, the latter common in fir woods, where the larvæ may also be found. The Micros on the whole have been plentiful, including *Crambus falsellus*, *C. margaritellus*, *Odontia dentalis*, *Scoparia murana*, *Roxana arcuana*, and *Epigraphia Steinkellneriana*. The larvæ of *Hadena pisi* have been over-abundant, whole acres of bracken (*Pteris aquilina*) having been stripped by them in the neighbourhood of Dollar; they also attacked the lady-fern (*Athyrium Filix-fœmina*). I may safely add that the Lepidoptera generally, with the exception of the butterflies, have been in these districts quite as numerous as last season.—WILFRED W. O. BEVERIDGE; 8, Eldon Street, Edinburgh, October 23, 1882.

NOTES ON THE SEASON.—With regard to the Lepidoptera of the past season, I have to write in the like melancholy strain adopted by most of your correspondents, for, as far as this neighbourhood is concerned, I never remember such a dearth of insects of all kinds. Only one butterfly was common, and that was *Vanessa urticæ;* and this species seemed to make up in numbers for the scarcity of others, being more than usually abundant. Sugar was a complete failure: after having tried almost every night for about two months and being rewarded with three *Noctua rubi*, I gave up in disgust. Amongst larvæ I had *Chœrocampa elpenor*, *Smerinthus tiliæ*, and *Cerura vinula*, and few enough of these. I send these remarks, which are of value only as showing in yet another district the remarkable paucity of Lepidoptera, to be attributed without doubt to the severe storm on 29th April last.—JOSEPH ANDERSON, JUN.; Chichester.

NOTES FROM FOLKESTONE.—As complaints about the dearth of Lepidoptera this autumn seem general, it will perhaps not be deemed impertinent if I give the result of a week's collecting at Folkestone, ending September 23rd, 1882:—*Vanessa urticæ*, *V. Io*, *V. Atalanta*, *V. cardui*, *Satyrus Megæra*, *S. Ægeria*, *S. Semele*, *S. Janira*, *Chortobius Pamphilus*, *Lycæna Agestis*, *L. Alexis*, *L. Adonis*, *L. Corydon*, *Colias Edusa* (var. *Helice* taken the same day), *Gonepteryx Rhamni*, *Pieris napi*, *P. rapæ*, *P. brassicæ*, *Hesperia linea*, and *Polyommatus Phlæas*. Amongst the moths I was not so successful: *Plusia gamma* and *Noctua xanthographa* swarmed in sunshine and shade. Three nights' sugaring in the Warren did not result in much, probably owing to prevailing north-east winds and moonlight nights. *Phlogophora meticulosa* just out, *ad libitum*. I counted nine specimens on one post, with their wings not yet dried. *Noctua c-nigrum*, *Agrotis saucia*, and *Calocampa vetusta* were all I met with. I also came across an interesting fact, which I had not heard of before, viz., the cannibalistic propensities of a large species of grasshopper. Whilst having a rest, after working for *Lycæna Adonis*, I saw a specimen coolly devouring a smaller comrade, which he held in his fore feet, something like a squirrel does a nut, and chirruping merrily the while.—T. W. Hall; 279, Lewisham High Road, London, S.E.

[This reminds me of a recently overheard conversation between two boys, as follows:—"Teddy, do you know what that grasshopper is doing?" "No, Ginx." "Why, he is saying grace before he eats his brother!"—so others have noticed this habit. —J. T. C.]

Colias Edusa in Sussex.—Yesterday, while driving to Hailsham, I was pleased to see a fine male *C. Edusa* flying by the wood-side.—Rosa M. Sotheby; Rozel, Upperton Gardens, Eastbourne, August 30, 1882.

Capture of Colias Helice near Norwich.—I have just seen a fine *Colias Helice*, which was taken by a collector at Heigham, near this city, about the 15th of September. This specimen was found at dusk at rest on the leaf of a cabbage growing in his garden. As the result of inquiries this appears to be the only specimen of *Colias* observed in the neighbourhood of Norwich this season. It would be interesting to know whether *C. Edusa* or its variety have been seen or captured elsewhere.—R. Laddiman; Upper Hellesdon, Norwich.

Argynnis Lathonia at Dover.—During a recent sojourn with one of my sons at this place, we carefully worked, on every favourable opportunity, the known haunts of this beautiful little species, being once or twice accompanied by Mr. Gray; but although we saw two *Lathonia* on the wing, we failed to capture either. On the last day of our stay, however (the 13th inst.), in company with Mr. Gray and his eldest son, we, at my suggestion, tried another (though likely-looking) piece of ground, and had not long commenced operations before a specimen was started up and taken by Mr. Gray; and shortly afterwards I had the pleasure of capturing another. We therefore decided to remain where we were rather than revert to the old locality, and after a long morning's work our perseverance was rewarded by the muster amongst us of no less than eight captures, our only regret being that we had not discovered this resort sooner, as some of the specimens were rather worn and broken. The following is, I believe, a correct list of all other captures this season at Dover:—One taken by a lad on the 10th (near the old ground); three (one being a cripple that could not fly far) by Mr. Gray, jun., and one by another gentleman on the 14th; two by Mr. Webb, and two by Mr. Gray's sons on the 15th; one by Mr. Davis, of Dover, and two by Mr. Gray on the 17th; one by Mr. G. Gray, jun., on the 18th; one by Mr. Gray, jun., and one by a lad (at some distance from this spot) on the 20th; and two by Mr. G. Gray, jun., on the 21st; making twenty-five in all, the "Queen of Spain" thus proving herself a brilliant exception to the general entomological poverty of the season. Mr. Gray has kindly forwarded to me (alive) day by day, as taken, most of his own and his sons' captures. I would only add that during the whole of our stay the prevailing winds were rather towards than from the French coast.—E. Sabine; 17, The Villas, Erith, September 27. 1882.

Lycæna Corydon in Kent.—Although the season has been a bad one for Lepidoptera generally, yet in justice to some of the Diurni I must say that I have found them more than usually abundant, such as *Gonepteryx rhamni*, *Satyrus hyperanthus*, and *Lycæna Corydon;* indeed the latter were out in countless thousands at one inland spot in this county, and I was able to secure a very fine lot of varieties, including some beautiful upper sides of the female, in all shades of colour from light brown to almost black, a good number having much blue on all the wings. I attribute my success in a great measure to the place being (as I believe) quite unknown to collectors, having never met with or seen anyone about; and a remark made to me by a workman in the locality, "Sir, I've heerd tell of you butterfly-catcher gentlemen, but I never seed one before, there!" would seem to confirm this idea. From a conservative point of view this remark was very satisfactory.—E. SABINE; 17, The Villas, Erith.

LYCÆNA BŒTICA NEAR BOURNEMOUTH.—I have to record a most interesting addition to the Diurni of this locality during the present week. On Monday last, Oct. 2nd, it appears that Miss Staples, daughter of Lady Staples, residing in Bournemouth, went out on the moor opposite the West Railway-station for the purpose of obtaining a red admiral to sketch and paint, when she saw and netted what she at first supposed—from its size, colour, and manner of flight—to be a common blue, but which to her surprise turned out to be a veritable specimen of *L. Bœtica*. As Miss Staples is not making any collection of Lepidoptera herself, she has, after painting the specimen, kindly presented it to me, with a detailed statement of all the circumstances connected with its capture. That there may be no doubt as to the identity of the species I purpose submitting the specimen to the inspection of Mr. Carrington, who will, I hope, favour us with an editorial note.—W. MCRAE; Westbourne House, Bournemouth, October 7, 1882.

[The specimen sent was a veritable *L. Bœtica*.—J. T. C.]

ON THE EMERGENCE OF BUTTERFLIES.—Mr. J. N. Pierce, of Liverpool, has favoured me with the following communication in reply to my note on *Apatura Iris* in the 'Entomologist' (xv. 188), in which I desired information respecting the habit of different species of butterflies, upon their emergence, clinging, or not, to the empty chrysalis-case, and more especially as to the reversal of their position on the puparium after a certain time, as noticed in the case of *Apatura Iris*. It may be interesting to others, as well as to myself, to know the result of his observations, and I therefore forward them:—"With reference to your note in the 'Entomologist,' I have just finished breeding a quantity of *Vanessa Io*, *V. urticæ*, and *Erebia Medea*, and notice this:—*Vanessa Io*.—Many of these imagines on emerging cling to the pupa-case; but not in every case, some going to the side,—these may go after their wings are developed,—and remain clinging to the empty pupa-shell wings downward. I have not noticed any reverse their position, and do not think they do so. *Vanessa urticæ*.—Some leave the pupa and go to the side of the breeding-cage to develop their wings, whilst others remain on the pupa-case to perform the operation; in both instances hanging with their wings down, and I have not noticed any reverse the position. *Erebia Medea.*—These leave the pupa *immediately* and walk up the grass stems, or side of the breeding-cage, and hang with their wings down to develop." Perhaps other lepidopterists may give us their experience of other species.—JOSEPH ANDERSON, JUN.; Chichester, September, 1882.

ACHERONTIA ATROPOS IN CO. SLIGO.—A fine specimen of the above was taken by me on Sept. 24th. This is the first I have known to be taken in this part of Ireland.—PERCY H. RUSS; Culleenamore, Sligo.

ACHERONTIA ATROPOS IN SCOTLAND.—A splendid specimen of *Acherontia Atropos* was recently taken in one of the back passages in Yester House (the residence of the Marquis of Tweeddale), situated near Gifford, Haddingtonshire. The moth measured six inches from tip to tip of the wings.—G. M. BROTHERSTON; 18, St. John Street, Edinburgh, October, 1882.

EMMELESIA BLANDIATA.—In reply to the query attached to the notice I sent you respecting the capture of *E. Blandiata* (Entom. xv. 235) I am "quite sure" as to the identity of the said insect. It was among numerous other species which I captured in Sussex and took to Mr. Hodgkinson for the purpose of having them named, and it was he who pointed it out. I was quite unaware of the species and its habitat at the time.—[Rev.] H. T. HUTCHINSON; Whalley, Blackburn, Lanc., Oct. 25, 1882.

REPUTED PARTHENOGENESIS OF ANARTA MYRTILLI.—Having noticed what to me is a curious thing, I venture to send you the following note:—A few weeks ago my son (aged four years) brought me a pupa of *Anarta myrtilli,* which he had found in the road, and I put it in a tin box to please him, thinking it would not survive the pressure it had received, as it was nearly flat. To-day, the 14th July, requiring a box for collecting, on opening the lid I saw the remains of the imago of *A. myrtilli* and the eggs it had deposited on the side of the box, with dust at the bottom, which through curiosity I put under a pocket-lens, when to my surprise I saw a number of small larvæ. This led me to examine the eggs, and I found that they had all hatched. Nothing could possibly have got into the box, as it was in my desk, and I had almost forgotten it. Of course the larvæ were all dead, or I should have tried to rear them. Perhaps your readers may enlighten me on the subject.—J. A. WATSON; Carsick Hill, near Sheffield.

RETINIA DUPLANA.—Mr. Barrett informs me that my supposed *Retinia duplana* is a male of *Eriopsela quadrana*. The specimen was named from a type in Mr. Hodgkinson's collection, and the mistake is thus accounted for. I owe Mr. Barrett my thanks for thus putting the identity of the insect beyond a doubt.—J. H. THRELFALL; Preston.

PTEROPHORUS SEROTINUS. — What a long time this species continues on the wing! In an old rough field, overgrown with *Scabiosa*, adjoining Lepton Great Wood, near here, I have taken it this year continually from June 12th until to-day, October 14th. In July it was in great abundance, and has gradually decreased in numbers since. I only took it in fine condition early in the season, or should have thought the late specimens belonged to a second brood.—GEO. T. PORRITT; Huddersfield.

CISSOPHAGUS HEDERÆ, *Schmidt*.—Dr. Capron, in last month's 'Entomologist' (Entom. xv. 212), expressed his opinion that *Cissophagus hederæ* ought not to be omitted from our lists. He is certainly right in the matter, apart from the fact that he has himself taken the insect. In the 'Entomologist's Annual' for 1872, p. 86, Mr. Rye speaks of it as a "somewhat rare British insect;" and reference will be found to it in Ent. Mo. Mag. viii. 107. The genus *Cissophagus* was founded by Chapuis to contain this insect, and he also founded the genus *Xylechinus* for *Carphoborus pilosus*; neither of these genera, however, are now admitted into the European catalogue; *Carphoborus* is made to include *X. pilosus*, and *Cissophagus hederæ* is considered a part of the genus *Hylurgus*. To this genus we must also add in the British list, *Hylurgus minor*, Hart., and probably *H. ligniperda*, Fabr., of which I believe there is a specimen in Mr. Rye's collection, now in the possession of Mr. Mason. It is an ordinary south and mid-European species. We must also insert close to *Scolytus* the very distinct *Polygraphus pubescens*, Fabr., which was taken some years ago by Mr Lawson, near Scarborough, under fir bark: a full account of this insect may be found in Ent. Ann., 1872, 88. It is also probable that one *Scolytus*, at least, and another *Pityophthorus*, will have to be added to the British list, so that we may see that a good deal yet remains to be done among our wood-borers, and every collector should be careful to examine closely, and set on one side, any forms of which he is doubtful. — [Rev.] W. W. FOWLER; Lincoln, September 15, 1882.

GALLS OF GYMNETRON VILLOSULUM, *Gyllenhal*, AND LARVÆ OF ATHALIA ANNULATA (?), *Klug.*, ON VERONICA ANAGALLIS.—Dr. Paxton, of this town, having noticed for some years past certain galls on *Veronica anagallis* growing on the banks of the canal here, and on the sides of the River Lavant, at Lavant, brought them to me for determination. The capsules of the plant are transformed into a roundish green gall, about the size of a dried pea, some of which upon opening contained the larvæ, some the pupæ, of a beetle, and others the beetle itself. Seeing it to be a weevil, but not knowing the species, I sent them to our good friend Mr. Fitch, who is always so ready to impart his varied and valuable information. From him I learn that the beetle is *Gymnetron villosulum* of Gyllenhal; he also adds that he has neither seen the gall himself, nor does Müller mention it in his list of gall-makers in the 'Annual' for 1872. Last Saturday, upon searching *Veronica anagallis* for more galls, I found the larva of a sawfly feeding upon this plant; these I collected, and forwarded to Mr. Fitch for identification. He writes:—"The sawfly larvæ are those of *Athalia annulata*, Klug., I believe, but try to breed the imagos; the larvæ will soon go into the earth, but will not pupate until the spring, so do not disturb them. The larvæ greatly resemble those of the turnip 'nigger' (*Athalia spinarum*), which is well figured in Curtis's 'Farm Insects,' pl. B, and in George Newport's essay, published by the Entomological Society."—JOSEPH ANDERSON, jun.; Chichester.

NAPHTHALINE.—In the July number of the 'Entomologist' is an article, by Mr. Jenner Weir, on the use of naphthaline. I see that in his experience of it, prepared in cones, it tends to grease and to discolour cabinet-drawers; for the latter I cannot answer but the white crystals of naphthaline I have used, and know a great many who use it find it is not only a preventative against mites but that grease does not appear in the drawers when naphthaline is used in the camphor-cells. I can only say I have used naphthaline for about two years, and, so far as I can see, there is nothing half so good all round both against mites and grease. In many cases I find camphor is still used, and generally plenty of grease can be seen on nearly all the insects.—EDWARD COOKE; 30, Museum Street, W.C., August 16, 1882.

PREVENTION OF MOULD.—The Rev. J. Tasker (Entom. xv. 233) says that glacial carbolic acid is a perfect remedy for mould. Now, as this preventative will doubtless be tried by some of your readers, and as I suffered some years since from using it precisely in the manner described by your correspondent, and which, I may add, was recommended to me by good authority, I should like, by way of a caution, to let others know the result of my experiment. The prepared pads of cotton-wool were placed in my drawers of Lepidoptera. This was no sooner done than it was evident that mould could not exist in its company; but ere sufficient time had elapsed for me to thank my informer, and congratulate myself upon the success obtained, I discovered another and more serious evil in connection with the Whites, which in some instances were fast turning to a dirty cream-colour; this fact was most conspicuous with *Liparis salicis*, *Dysthymia Acontia*, and *Melanippe hastata*, but, on the other hand, none of the Diurni had changed in appearance. Here was a curious problem, but one easy to solve, as the former species had been cyanised with spirits of wine possessing the orthodox proportion of corrosive sublimate, while the latter had not been so treated. A subsequent special experiment corroborated the previous result, and at once clearly demonstrated that either the use of glacial carbolic acid, or cyanising insects which happened to have white upon them, must be abandoned. — H. T. DOBSON, jun., New Malden, Surrey, Oct. 21, 1882.

ERRATUM.—At p. 238 the capture of *Harpalus oblongiusculus* is stated to have been made by the Rev. O. P. Cambridge. The capture was made and the communication sent by Mr. Frederick O. P. Cambridge.

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NATURAL LOCALITIES OF BRITISH COLEOPTERA.

By Rev. W. W. Fowler, M.A., F.L.S.

No. X.—FUNGI, FENCES, SAP, FAGGOTS, &c.

In the autumn nothing repays a collector better than working at Fungi; not that Fungi at any season of the year are not equally productive, but in the autumn the Fungi themselves are more abundant, and other methods of collecting begin to fail. Among the beetles found in Fungi, species of *Gyrophæna*, *Bolitochara*, *Bolitobius*, *Mycetophagus*, *Proteinus*, *Megarthrus*, *Cychramus*, *Epuræa*, &c., are very conspicuous; *Oxypoda alternans* and *Autalia impressa* are nearly always to be found; and the following *Homalotæ* occur:—*H. fungivora*, *H. fungicola*, *H. boletobia*, *H. nigritula*, *H. sodalis*, *H. gagatina*, *H. angusticollis*, *H. corvina*, and *H. oblita; Agaricochara lævicollis* is rarely found, but *Gyrophænæ* of various species are almost always present; *Oxyporus rufus* is occasionally found in some numbers, mining transverse galleries through the gills of large Fungi. All, or nearly all, the above-mentioned beetles occur in the large soft-stemmed Fungi that are so common in every wood in autumn; but, besides these, boleti and all fungoid growths on trunks of trees, whether high up or lower down near the roots, should be carefully examined. *Engis humeralis* and *rufifrons*, *Ennearthron fronticorne*, *Octotemnus glabriculus*, *Cis alni*, *Triplax russica*, *Tetratoma fungorum*, *Triphyllus suturalis*, *Rhizophagi*, and many others may be obtained in these: the best plan is to collect a bag full of boleti and keep the contents at home in an old box; large numbers of good species may be bred out in this way. Even the small scaly Fungi that are found on trunks of trees lying on the ground will sometimes produce very good beetles.

The rare *Sphindus dubius* and *Aspidiphorus orbiculatus* have been taken from fungus on fir-trees. *Sphindus dubius* has also been found in black powdery fungus on alder, together with *Lathridius rugosus* and species of *Liodes*. *Lathridius testaceus* has been obtained from the same kind of fungus on beech bark, and other rare *Lathridii*, such as *L. filiformis*, have occurred in Fungi. *Carida flexuosa* has been taken in Scotland in some numbers, in hard woody fungus on alder, *Epuræa variegata* at Rannoch, in fungus on rotten birches, and *Rhizophagus cribratus* in various localities. Mr. J. J. Walker took a large number of this rather rare species in Ireland a short while before he last left England. The exceedingly rare *Diaperis boleti* has not been taken for years, but is recorded as having been found once or twice in some numbers many years ago in boleti, by Mr. Kirby near Barham, and I believe in the New Forest by Mr. Dale. Most of the old collections contain one specimen at least, and there is no reason why it should not again turn up like *Spercheus*. *Heledona agricola* sometimes occurs very abundantly in boleti, and *Bolitophagus reticulatus* is a rarer species of the Heteromera that is found in Scotland in the same habitat. *Agathidia*, *Cryptophagi*, *Cholevæ*, *Histers*, and sometimes good *Philonthi* (such as *P. corvinus* taken by Dr. Power at Mickleham), may be found in Fungi, and probably most collectors could add many species to those above-mentioned: from those, however, that have been mentioned, it may be easily gathered what kinds of beetles may be expected to be met with by a collector. *Anisotoma cinnamomea* is sometimes found in truffles; *Atomaria fimetarii* and *Rhizophagus parallelocollis* have been taken in abundance near York, by Archdeacon Hey, in *Coprinus comatus*, and the *Lycoperdon* or puff-ball almost always yields *Cryptophagus lycoperdi*, and occasionally the much rarer *Lycoperdina bovistæ*. As I said just now that Fungi were productive at any period of the year as well as in autumn, which is generally considered the great time for this method of collecting, I may mention in conclusion that I found a fungus or two near Lincoln on a warm day in May last, which were full of *Epuræa deleta*, *Gyrophænæ*, &c.

It is well-known to collectors of Lepidoptera how profitable a collecting ground a wooden fence or paling is; it is equally good for Coleoptera. Many rare species seem to take pleasure in settling on palings in the sunshine, besides those species that utilise them by boring in them. Mr. S. Stevens has found the very rare *Teretrius picipes* in some numbers on a fence near Norwood, and the almost equally rare *Tillus unifasciatus* and *Lyctus brunneus* sparingly, on the same palings. Good *Staphylinidæ*, such as *Calodera umbrosa*, may be taken in the same way, and many other species. Longicorns are very fond of settling on wooden fences; *Molorchus minor* has been taken on a fence near Hampstead, and the new *Pachyta sexmaculata* was taken not long ago on a fir-paling in Scotland. Certain beetles of course inhabit the interior of the wood; of these *Xyletinus ater* is one of the best. Mr. Hadfield of Newark, one of our oldest collectors, who was a friend of Mr. Dawson's, and helped him with several species for the 'Geodephaga Britannica,' took me a short time ago to see a fence on which he used to take this rare beetle plentifully; the fence, unluckily, had just been removed, but the number of duplicates that Mr. Hadfield had sent away, and still possessed, showed how abundant this rare beetle must have been in that particular locality. One thing must be noticed, and that is, that for the species that settle in the sun and are not borers, the palings must be new; for the boring species they cannot be too old. Some of this class of beetles are parasitic (as *Teretrius picipes* on *Ptilinus*), but it seems possible that some are attracted by the sap and moisture remaining in the new wood. The reason of this probably is that the sap of the wood at first is an attraction, and this leads us to speak of sap as a method of collecting. If the trunk of a tree be examined in the spring after it has been cut down—and trees are usually felled in autumn or winter—it will be found that a large quantity of sap is exuding from them; great numbers of beetles come to this sap, and very good species may be captured among the *Carabidæ*, *Tachini* and other *Staphylinidæ*, *Epuræœ*, *Cryptophagidæ*, and many other families. Longicorns are especially fond of sap, and may often be taken in this way, especially in Scotland, where *Cetonia floricola* has been taken at the same sweets. The sap of birch seems very attractive to many varieties, among them *Sphærites glabratus*, *Epuræa silacea*, *E. variegata*, *E. parvula*, and *E. immunda*, and the very rare *Paramecosoma serrata*. In the second year the stump is nearly useless; fresh stumps should be taken note of in the winter and visited in the spring: it is a good plan to pile chips on and around the stumps, as they harbour the beetles and keep them from going away. Chips themselves are exceedingly productive if placed in a heap; *Homalia*, *Philonthi*, *Trichopterygia*, and many others, among them very rare species, may be found by shaking them over paper; single large chips lying on the ground will sometimes be found to have good beetles attached to them or lying under them; among others may be mentioned *Eros Aurora* found in this way at Rannoch.

Faggots are well worth working: these again must be comparatively fresh; an old faggot is of very little use, at least I have never found one that produced much worth having, while faggots that have been cut only a short time and laid on the ground will often be found to swarm with insects. I remember shaking some over a sheet in Sherwood Forest and taking quantities of things. *Lathridius nodifer* of course swarmed, accompanied by one or two of the rarer *Lathridii*, *Epuræa parvula*, *Trichopteryx fascicularis*, and other species. Mr. Matthews, on one occasion, took the rare *Trichopteryx obscæna* in the same way. From faggot-stacks good things like *Cryphalus fagi*, and others, may occasionally be obtained. *Trachodes hispidus* was found in abundance in faggots near Leicester, and I feel certain that it must have been from faggots that Turner obtained such numbers of *Cryphalus tiliæ* near Lincoln; the tree is called "bass" by the natives, and is a species of *Tilia*, but is more of a shrub than a tree, with the growth of a large hazel; there is no trunk or bark for a *Cryphalus* to bore in. I have a faggot at present concealed in the wood where I believe he found it, and hope to turn up this beetle again, though hitherto I have been unsuccessful.

Dry bramble-sticks are very profitable, and in fact dry sticks of any kind. Under dry sticks or faggots laid down in a wood to make a passable road, the late Mr. Garneys once found *Stilicus fragilis* in abundance; Dr. Power and Mr. Fitch shook this same species out of some dry oak-faggots in a wood near Dorking. *Hedobia imperialis*, *Pogonocherus dentatus*, and other species, may be beaten out of dry brambles or hawthorn hedges. The very rare *Tropideres niveirostris* has been taken by beating dry sticks; and from collected dry twigs Mr. Plant, of Leicester, once bred *Tropideres sepicola*. We are, however, now trenching upon the subject of wood-collecting proper, which will be fully treated of in the next paper.

The School House, Lincoln, 9th November, 1882.

A DAY'S COLLECTING ON BEN TIGH.

By J. H. Leech.

Having spent a month or so collecting in the Highlands of Inverness and Ross-shire, I think it may interest some of the entomologists of our southern counties to hear a little about Scotch collecting during the past season, I will give a short account of one of the many pleasant days spent in company with Mr. E. G. Meek collecting, and which proved very good, contrary to the experience of many this season.

We were stopping at Invergany, a little village some seven miles or so from Fort Augustus, when we decided to have a day's collecting on Ben Tigh, a mountain about 2800 feet high, situated about six miles from the inn. Making our preparations over-night we retired to rest early, so as to be ready for a hard day's work. On rising, greatly to our delight, we found a cloudless sky and a bright sun; it had been raining almost without intermission for the previous few days. After a hearty Scotch breakfast we were ready for a start, having obtained the "factor's" permission, as Ben Tigh is a strictly preserved deer forest. We first made our way through some woods, composed chiefly of birch and fir, where *Platypteryx lacertula* and *P. falcula* were to be seen at rest, occasionally being tempted to stop and box a *Fidonia brunneata;* this insect which, so far as I have been able to ascertain, has only been taken at Rannoch, was flying very abundantly, though, as usual, rather worn. The reason of its never being taken in fine condition I believe to be this: the food-plant of *F. brunneata*, viz., the bilberry, grows with the common heather, on which the insect always rests in preference to other plants. In this locality the heather is covered with minute cobwebs, in which *F. brunneata*, as I frequently noticed, gets entangled, and damages itself in the rough heather with its efforts to escape. *Acidalia fumata, Larentia cæsiata, Fidonia piniaria, Larentia pectinitaria*, and a host of the commoner Geometræ, were put up at every step; *Cidaria populata* being noticeable from its variableness, some specimens being very dark, and others with the most indistinct markings. *Boarmia repandata, Venusia cambricaria* and *Ellopia fasciaria* were to be seen at rest on the fir trees. We also took a fine dark variety of *Dicranura vinula*, although rather late in the season for it; but we were not yet on proper hunting ground.

Leaving the woods we came upon a fine stretch of open moorland gradually rising to the foot of the mountain,—a very imposing height, from its symmetrical shape, and from the absence of any other mountain in the immediate neighbourhood of corresponding elevation. As we proceeded *Chortobius Davus* was to be seen flying in swarms in every direction, the specimens strongly resembling the Hebridian forms. *C. Pamphilus* was also flying sparingly, looking dwarfed beside its big neighbour; and every now and then a fine *Argynnis Aglaia*, better marked and more powerful than the southern specimens. We captured a very fine specimen of *Lycæna Alexis* (female), the ground colour of the wings being as bright as a male, with all the red spots very distinct, the central spot on the under side of the fore wings showing through in the shape of a white ring, and the costal margin being of a light blue, almost the colour of *Lycæna Corydon*. Here also we boxed some *Crambus ericellus*, the prize of the day; and, as we began to ascend, the pretty little *Emmelesia blandiata* was to be seen in every direction flying in twos and threes, and in the finest possible condition; higher up we came upon *Scopula alpinalis*, just out; also *P. decrepitalis*, one worn specimen; and in a marshy hollow, *Crambus furcatellus* and *C. margaritellus*. The Crowberry was growing plentifully, so we began searching for the pupæ of *Pachnobia hyperborea;* we soon found the larvæ feeding among the roots in the first year's growth; but after half an hour's search we gave it up, as neither of us were "very keen on it." The little Tortrix, *Sericoris irriguana*, was flying about and settling on the moss, so we took a series. The sun was high, and we were beginning to get warm.

After lunch we went on to the top, taking *Psodos trepidaria*, which was out in swarms, though mostly worn. Beyond this nothing fresh occurred at the top; however we were well repaid for our climb by the splendid view,—Ben Nevis, covered with snow, looked quite close. Beneath us were feeding two fine red deer, quite unconscious of our presence, although within 200 yards; and the ptarmigan and blue hares were not at all uncommon; but what attracted us most was a splendid golden eagle flying boldly round, as if astonished at being disturbed. On our way down, besides our former captures, we took some fine varieties of *Bactra lanceolana*, and some *Coccyx ustomaculana*, *Aphelia pratana*, &c.

It now began to look stormy, so as we had our boxes full we made for home. *Lithosia mesomella* was flying in the grassy openings of the woods, and *Hepialus hectus* was common, flying about the fern; *H. velleda* and *H. humuli* were plentiful in open fields, the latter rather like the plain form from Shetland, with dark thorax. As we got near home we were startled by a few heavy drops of rain, and had only just got back when it came down in torrents. We concluded not to sugar; indeed my experience of sugar here has not been pleasant; although we tried very promising localities in the hope of taking *Crymodes exulis*, we never saw anything better than *Acronycta leporina*, *Aplecta herbida*, and the usual band of "sugar robbers."

4, Holland Park, W., November, 1882.

THE LEPIDOPTERA OF HACKNEY MARSHES

By Ernest Anderson.

The Hackney marshes formerly comprised a far larger area suitable for the observations of an entomologist than at present; but every year the buildings encroach from Homerton and Clapton on the one side, and Stratford and Leytonstone on the other. The number of Lepidoptera to be found in the now limited space is, however, still fairly numerous, though unfortunately many species appear in decreasing numbers each year and threaten to disappear altogether very shortly. The cutting down of the splendid row of willows, which a few years ago fringed the Lea for over a mile, gave a severe blow to Entomology in the district, and its effects were perceptible almost immediately in the reduced numbers of willow-feeding species, such as *Cossus ligniperda*, *Liparis salicis*, *Smerinthus populi*, *Catocala nupta*, &c. However, instead of dwelling upon what has been, it will be better, for the benefit of present entomologists, to enumerate those species which may still be observed.

Diurni are poorly represented, *Pieris brassicæ*, *P. rapæ*, and more commonly *P. napi*, together with *Vanessa urticæ*, comprising almost the whole list, relieved by a few *Satyrus Janira* and a stray

Vanessa Atalanta or two. In special years, however, *Vanessa cardui* and *Colias Edusa* have both appeared in considerable abundance, but of course must be considered as visitors only. *Smerinthus populi* is now somewhat scarce, but may still be observed occasionally both in the larval and perfect state upon the willow-trunks; and the pupæ are fairly common in autumn at the roots of those trees. *Cossus ligniperda*, once very common, is now almost rare. *Hepialus lupulinus* flies swiftly at dusk in June, and the larvæ of its congener, *H. humuli*, may be obtained commonly at the roots of dock in May, the perfect insect being observed in countless numbers a month later, the females being busily employed in shooting out their small black eggs amongst the rank herbage.

In the whitethorn hedges the little larvæ of *Nola cucullatella* are busy throughout June, combining with *Yponomeuta padella* and *Tortrix ribeana* to strip almost every leaf; the imagines are equally abundant in July, sitting on twigs of whitethorn and palings. *Arctia caja* is common in the larval state, but the moth is rarely observed. *A. lubricipeda* and *A. menthastri*, it is almost unnecessary to remark, are everywhere. *Liparis salicis* is abundant in all stages, branches of willow being sometimes festooned with the pupæ. *Orgyia antiqua* must be regarded as a visitor from town, and one *Cilix spinula* has at present only one record all to itself, hence it would seem a rarity in this locality; but, taking into consideration its size and habits, there can be no doubt but that it is a regular inhabitant. The remarks on *Smerinthus populi* apply equally well to *Dicranura vinula* and also to *Pygæra bucephala*, which, however, is perhaps more commonly met with in the larval state than either of the other two.

We now come to the Geometræ, of which the list is very meagre. *Rumia cratægata* flies near, and the larvæ may be beaten from whitethorn hedges. *Crocallis elinguaria* more rarely in the same situations, the larvæ in May, the imagines in July and August. *Hemerophila abruptaria* occurs on the fringes of the marsh, evidently feeding on the privet and lilac in the neighbouring gardens. *Biston hirtaria* and *Boarmia rhomboidaria* are both fairly common at their respective times of appearance. *Acidalia scutulata* may be readily obtained at dusk flying over the mixed herbage, being almost the only representative of its genus, the exception being *A. incanaria*, which, however, is rarely seen.

Abraxas grossulariata fortunately is not common, and out of the *Eupitheciæ* three species only have been discovered at present, these being *E. vulgata*, *E. subnotata*, and *E. centaureata*, the latter being common on flowers at night, the two former being rather scarce. *Melanippe fluctuata* is abundant and well distributed; *Coremia unidentaria* and *Camptogramma bilineata* being more localised, both, however, being fairly plentiful. *Pelurga comitata* concludes the list, but is rarely seen, though its food-plant, *Chenopodium*, is very abundant.

Of Noctuæ we have a more plentiful supply, a large number being grass-feeders. *Acronycta psi* and *A. megacephala* are both numerous, as are also *Leucania pallens* and *L. impura*, the larvæ of which may be obtained, in the early spring, on grasses at night. *Hydrœcia micacea* is decidedly scarce, only three having been observed. *Axylia putris*, *Xylophasia polyodon*, and *X. lithoxylea* are all common, the latter frequently being a perfect pest at sugar. *Dipterygia pinastri*, once fairly common, is now rare without any apparent reason. *Mamestra brassicæ* and *M. persicariæ* both appear in abundance. Of the seven species of *Apamea* no less than five occur, namely, *A. basilinea*, *A. gemina*, *A. unanimis*, *A. ophiogramma*, and *A. oculea*, *A. ophiogramma* being the rarest; but it may be confidently reckoned upon at its right time, coming to both sugar and thistle flower-heads. *A. oculea* is very numerous, all varieties being common.

Miana strigilis occurs abundantly; *M. fasciuncula* rarely. *Caradrina Morpheus* is generally a pest, being in great numbers; its congeners, *C. alsines* and *C. cubicularis*, however, being much more rarely seen. *Agrotis segetum* is scarce, but its absence is made up for by the abundance of *A. exclamationis*. *A. nigricans* is also fairly common. *Triphæna pronuba*, as usual, is a nuisance. *Noctua plecta*, *N. c-nigrum*, *N. rubi*, and *N. xanthographa* are common, the larvæ of the latter being very plentiful, in early spring, upon grass banks. The larvæ of *Tæniocampa gothica* are also very numerous on dock in June, and those of *Orthosia upsilon* a little earlier, ascending the willow-trunks at dusk; this moth comes readily to sugar in the early part of July.

Phlogophora meticulosa is a rarity; not unknown, however. *Hadena chenopodii*, as usual, is most abundant in the larval state upon knot-grass, goose-foot, &c.; *H. oleracea* being equally abundant in all stages. *Plusia gamma*, *Mania typica*, *M. maura*, and *Catocala nupta* conclude the list, none of them being now in such numbers as formerly.

At some future date a list of the remaining division in this list may be forthcoming, but it must suffice for the present to say that there is good working ground for the Micro-lepidopterist.

I should here like to call attention to a curious fact which has become known to me only lately; possibly it is one already noted, but I do not remember its mention in any of the entomological works I have read. Upon several nights I found my sugar prove very unattractive, though there were evidently numbers of Lepidoptera about; upon looking for the cause I found that there was a superior attraction in the shape of the patches of thistles growing near, but I was surprised to find that it was not the flowers which were attractive. Many of the thistles were densely covered at the top with dingy green Aphides, and moths in great numbers were busily engaged in feeding upon the excrement which came from them; so intent were they upon the feast that the glare of my lantern had very little disturbing effect. The assemblage was composed chiefly of *Apamea oculea*, *Triphæna pronuba*, and *Leucania impura;* but many other species were sparingly represented. I am aware that ants are in the habit of feeding upon the excrement of Aphides, and have read that they even keep herds of them, if that term can be used; but the fact of Lepidoptera being attracted in the manner described was entirely new to me.

In conclusion, it may be safely inferred that several species not included in this list are in existence upon the marshes, chiefly amongst the species which are found towards the end of autumn, as the writer has not been enabled to pay such regular visits at that time as in the spring and summer. No doubt such species as *Agrotis saucia*, *A. suffusa*, *Gonoptera libatrix*, &c., would repay the searcher during September; and I trust those entomologists living near will turn their attention to the locality, which may again produce the coveted *Xylina lambda* (*Zinckenii*), which hybernates, and should be sought for also in spring.

4, Gascoyne Road, South Hackney, September, 1882.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

By John B. Bridgman and Edward A. Fitch.

No. III.—CRYPTIDÆ (*continued*).

We have already remarked on the unsatisfactory generic divisions of the Cryptidæ, and this is especially marked in the very closely-allied and large genera *Phygadeuon* and *Cryptus.* It is often impossible to say whether certain males belong to either of these genera, the *Ichneumones pneustici,* or even *Ichneumon* itself. Thomson and Taschenberg have done much to unite the sexes and generically determine many species, but the latter remarks, "I am still convinced that many Gravenhorstian species will have to be separated from here" (Zeits. Ges. Nat., 1865, p. 58); and Ratzeburg says, "I expect that many true Ichneumons are still retained in Gravenhorst's *Phygadeuon*" (Die Ichn., iii. 141). In descriptions we constantly meet with similar remarks to "might be an *Ichneumon,* but for its exserted ovipositor" (*P. errator,* Marsh., Ent. Mo. Mag. v. 155); this shows the difficulty that would be experienced with a male specimen only: compare the remarks upon Taschenberg's *P. aberrans,* in Trans. Ent. Soc., Lond., 1881, p. 152.

The sixty-four British species included in Marshall's 1870 catalogue were increased to seventy-one in 1872, and to these we have added six, viz. :—*P. tarsatus,* Bridgm. (see Trans. Ent. Soc., Lond., 1881, p. 150), *P. probus,* Tasch. (*l. c.,* p. 152), *P. nanus,* Gr. (Entom. xiii. 53), *P. fulgens,* Tasch. (one female in Marshall's collection from Bugbrooke, Northampton), *P. speculator,* Gr. (one female in Marshall's collection from St. Albans), and *P. Marshalli,* Bridgm. (two males, labelled "*procerus,* Gr., var. 2, n. sp.," in Marshall's collection from Barnstaple); of this last species Taschenberg says, "var. 2, fehlt!". The first species described, at Entom. xiii. 53, is *P. variabilis,* Gr., *var.,* which is probably a distinct species; the second is *P. semipolitus,* Tasch. The interesting subapterous form of *P. fumator* is referred to at Trans. Ent. Soc., Lond., 1881, p. 151, pl. viii., figs. 6–8. An outline figure of a *Phygadeuon* is given in Vollenhoven's 'Schetsen' (pt. i., pl. i., fig. 18), the head and abdomen of *P.* (*Cubocephalus*) *fortipes* are well drawn in Ratzeburg's 'Ichneumonen' (vol. ii., pl. i., fig. 14), and *P. tarsatus* is badly figured in Trans. Ent. Soc.

Lond. (1881, pl. viii., figs. 9, 9 *a*). Considering the size of the genus it is remarkable how few specimens have been bred. We have been able to find the hosts of twenty-eight species recorded, but these are mostly from single scattered records; we only know of five specimens, each belonging, however, to a distinct species, that have been bred in Britain. Ratzeburg says, "It is strange that a genus which is so extraordinarily rich in species, and of which numerous individuals live in certain forest insects produces so few species, I have not a single new species to mention in this volume" ('Die Ichneumonen,' iii. 140). Many of the larger Diptera are known hosts of several species, and it is not improbable that in some instances where Lepidoptera are given that the Ichneumon was itself parasitic on a parasitic dipteron (*Tachinidæ*, &c.). Several species have been bred from sawflies, and one from a beetle larva (*Hypera rumicis*), according to Kawall, who records that he saw a pair of the same species (*P. rufulus*) *in copulâ* for fifteen seconds on July 23rd, 1852 (Stett. Ent. Zeit., xix. 67). The male is still undescribed. Ratzeburg gives the life-history of *P. pteronorum*, Hart. (*basizonus*, Gr.), as bred by hundreds from *Lophyrus pini*, pointing out how its economy resembled that of a *Tryphon* ('Die Ichneumonen,' i. 143–4); and Bouché describes the larva and cocoon of *P. curvus*, Schrank, parasitic on *Fidonia piniaria* ('Naturgeschichte der Insekten,' p. 144).

The following British species have been bred:—

3.	nigrita, *Gr.*	from	Eristalis florens; (Kunckel) Giraud.
4.	flavimanus, *Gr.*	,,	Emphytus serotinus; Cameron.
5.	dumetorum, *Gr.*	,,	Stratiomys chameleon; Giraud.
7.	rufulus, *Gmel.*	,,	Hypera rumicis; Kawall.
8.	fumator, *Gr.*	,,	Mamestra brassicæ; Parfitt.
9.	tenuipes, *Gr.*	,,	Fumea nitidella; Siebold.
10.	troglodytes, *Gr.*	,,	Emphytus serotinus; Cameron.
12	æreus, *Gr.*	,,	Aporia cratægi, Pieris brassicæ (hyperparasitic), Eupithecia centaureata, Botys verticalis; Brischke.
26.	brevis, *Gr.*	,,	Carpocapsa pomonana; (Bouche) Ratzeburg.
29.	flagitator, *Gr.*	,,	Depressaria heracliana; Boie. D. depressella; Rondani.
32.	profligator, *Fabr.*	,,	Depressaria nervosa; Bouche (teste Curtis' 'Farm Insects').
37.	cinctorius, *Fabr.*		Geoffroy bred from *Scirpus* stem
38	parviventris, *Gr.*	,,	Lophyrus pini or similis; Brischke.
39.	quadrispinus, *Gr.*	,,	Eristalis sp.?; Marshall.

45. curvus, *Schr.* from Fidonia piniaria; Bouché.
49. obscuripes, *Tasch.* ,, Cynips Kollari gall; Billups.
56. basizonus, *Gr.* ,, Lophyrus pini; Ratz., (Reissig) Ratz., Taschenberg. L. pini or similis; Brischke. L. rufus; (Heeger) Ratz.
67. fortipes, *Gr.* ,, Strongylogaster cingulatus; Ratz.
69. subguttatus, *Gr.* ,, Lophyrus pini or similis; Brischke.

CRYPTUS, *Fabr.*

SUBDIVISION I.—Thorax black, with or without white marks, never red.

SECTION 1.—Scutellum and abdomen black, apex of latter sometimes white.

A. Metathoracic spiracles elongate and rather large (females).
a. Antennæ white-ringed; hind tarsi not white-ringed.
* Femora and tibiæ almost entirely red.
† Aculeus one-third the length of abdomen. - 3. *lugubris*, 4½ lines.
†† Aculeus nearly as long as the abdomen. - 4. *spiralis*, 3—5½ lines.
** Front tibiæ testaceous, remainder of legs dark.
‡ Areolet quadrangular. - - - - 11. *aterrimus*, 5 lines.
‡‡ Areolet pentagonal. - - - - 6. *monticola*, 8—9 lines.
b. Antennæ not white-ringed.
§ Hind tarsi more or less pale-ringed. - 8. *tarsoleucus*, 4½—7 lines.
§§ Hind tarsi not pale-ringed.
× Hind tibiæ and tarsi black-brown. - 10. *cyanator*, 6—7 lines.
× × Apex of hind tibiæ and tarsi black. - 9. *moschator*, 3—4½ lines.
B. Metathoracic spiracles small and round, or almost so (females).
a. Metathorax without longitudinal lines and without a supero-medial area; aculeus longer than the insect. 12. *subpetiolatus*, 4 lines.
b. Metathorax with faint longitudinal lines, which bound a more or less perfect supero-medial area.
* Aculeus not so long as the abdomen.
† Areolet of wings quadrate. - - 13. *parvulus*, 2½—3 lines.
†† Areolet pentagonal. - - - 19. *digitatus*, 2⅔—4 lines.
** Aculeus as long as the abdomen (‡), or as long as the insect (‡‡).
‡ Areolet converging, pentagonal; extreme apex of abdomen white.
14. *anatorius*, 3—4 lines.
‡‡ Areolet not converging, almost quadrate; apex of abdomen black.
15. *furcator*, 4—4⅔ lines.
C. Metathoracic spiracles large and oval (males).
Antennæ not white-ringed.
a. Hind tarsi ringed with white or fulvous.
* Hind tibiæ red. - - - - - 8. *tarsoleucus*, 4½—7 lines.
** Hind tibiæ black. - - - - 9. *moschator*, 3—4½ lines.
b. Hind tarsi not pale-ringed; femora and tibiæ red, apex of hinder black.
† Metathorax with a more or less complete supero-medial area.
5. *rufipes*, 3—5 lines.
†† Metathorax with only transverse lines.
‡ Thorax rather thickly clothed with black pubescence.
10. *cyanator*, 6—7 lines.
‡‡ Thorax with a little white pubescence. - 4. *spiralis*, 3—4½ lines.

D. Metathoracic spiracles small and round, or nearly so (males).

a. Antennæ white-ringed.

* Four apical joints of hind tarsi white. 19. *digitatus*, 2¾—4½ lines.

** Apical joints of hind tarsi not white.

† Hind legs red, apex black. - - 20. *grisescens*, 3¾—5 lines.

†† Hind legs black. - - - - 6. *monticola*, 8—9 lines.

b. Antennæ not white-ringed.

* Metathorax with distinct lateral spines.

† Areolet almost quadrate; supero-medial area perfectly closed. Coxæ and trochanters black. - - 13. *parvulus*, 3—4 lines.

†† Areolet converging in front; supero-medial area open in front. Femora and tibiæ red, apex of hinder black; internal orbits white. 16. *bilineatus*, 2¾ lines.

** Metathorax without lateral spines; lines of areæ prominent; femora and tibiæ red, apex of hinder black.

§ Mouth and internal orbits white. - 17. *stomaticus*, 3½—4 lines.

§§ Face entirely white.

× Areolet pentagonal or subquadrate. - 18. *leucopsis*, 3—4 lines.

× × Areolet subtriangular. - - 7. *canaliculatus*, almost 5 lines.

SECTION 2.—Scutellum pale; abdomen black.

A. Metathoracic spiracles elongate (male and female). Antennæ of female white-ringed; face of male white-marked. 1. *viduatorius*, 2½—5 lines.

B. Metathoracic spiracles circular and small (male). Greater part of femora and face black; hind tarsi white-ringed; segments 2nd and 3rd chestnut-margined, 7th partly white. 2. ***bicingulatus***, 4—5½ lines.

SECTION 3.—Scutellum black; abdomen red or red and black, apex not white.

1. **Aculeus not projecting.** Segments 2nd to 4th and greater part of legs red. - 60. ***bellus.***

2. **Aculeus distinctly projecting.**

A. Metathoracic spiracles large and elongate (females).

a. Antennæ black.

* Abdomen red, base black. - - 31. *obscurus*, 3½—7 lines.

** Segments 2nd and 3rd and apex of 1st red; aculeus about one-fourth of abdomen.

† Back part of metathorax slanting; front femora more or less red at the apex. - - - - 22. *titillator* var., 2½—5 lines.

†† Back part of metathorax perpendicular; all the femora black. 23. *obfuscator*, 5 lines.

b. Antennæ white-ringed or marked in the middle.

× Aculeus nearly as long as the body; base of abdomen and legs red, coxæ black. - - - - - - 53. *tumidus*, 4 lines.

× × Aculeus not longer than the abdomen.

* Abdomen entirely red, or base more or less black; aculeus about as long as the abdomen.

† Metathorax with two long, acute, lateral spines; greater part of legs dark. - - - - - - 28. *spinosus*, 3½—4½ lines.

†† Metathoracic spines short and stout; greater part of legs red. 30. *sponsor*, 4—6 lines.

** Middle of abdomen red.

‡ Aculeus less than one-half the length of the abdomen. 22. *titillator*, 2⅘—5 lines

‡‡ Aculeus nearly or quite as long as the abdomen.

§ Nervelet* not present. - - - 24. *minator*, 2⅓—3⅓ lines.

* (*Note.*)—The *nervelet* is a rudimentary nervure that sometimes springs from the nervure between the letters *l* and *q* on the right-hand wing of fig. 2 in the plate, given at the commencement of these papers.

§§ Nervelet distinct. - - - - 29. *Dianæ*, 3⅓—5 lines.

B. Metathoracic spiracles round or nearly so, and small (females).

a. Aculeus about one-sixth of the abdomen. 37. *analis*, 2½—4½ lines.

b. Aculeus about one-third of the abdomen. 35. *hostilis*, 3—3¾ lines.

c. Aculeus rather less than the abdomen. 39. *alternator*, 2⅓—3½ lines.

C. Metathoracic spiracles elongate and large (males).

a. Abdomen red, 1st segment more or less black; hind tarsi white-ringed.

* Antennæ black. - - - - 31. *obscurus*, 5—7⅓ lines.

** Antennæ white-ringed. - - - 28. *spinosus*, 3½—4½ lines.

b. Middle of abdomen red; hind tarsi white-ringed; antennæ black.

† Face black and legs also, except the red front tibiæ.

‡ Transverse anal nervure of hind wing behind the brachial fork.* 22. *titillator*, 2⅓—5 lines.

‡‡ Transverse anal nervure almost opposite. 37. *analis*, 2½—4½ lines.

* (*Note.*)—See plate, fig. 2, right hind wing. The terms *behind*, *opposite* or *in front of* the brachial fork alludes to the position of the upper juncture (α) of the transverse anal nervure in comparison with the lower (γ): it is said to be *in front* when α is nearer the thorax than γ, *opposite* when both are in the same line, and *behind* when α is further from the thorax than γ.

†† Face white-marked.

§ Front (and middle) coxæ and trochanters white-marked. 29. *Dianæ*, 3¾—4¾ lines.

§§ Front coxæ and trochanters black. - 24. *minator*, 3⅓ lines.

D. Metathoracic spiracles round, or nearly so, and small (males).
Middle of abdomen, ring of antennæ, tibiæ and hind tarsi, white. 39. *alternator*, 2⅓—3⅓ lines.

SECTION 4.—Scutellum pale; abdomen red or red and black, apex not white.

A. Metathoracic spiracles elongate and large (females).
Abdomen red, petiole more or less black; antennæ white-ringed.

a. Aculeus one-third the length of the abdomen. 26. *tuberculatus*, 4 lines.

b. Aculeus about as long as the abdomen.

* Hind femora red. - - - - - 21. *attentorius*, 6 lines.

** Hind femora black. - - - 27. *apparitorius*, 4—4⅕ lines.

B. Metathoracic spiracles round, or nearly so, and small (females).
Abdomen red; femora and tibiæ red; antennæ white-ringed.

a. Hind tarsi white-ringed; aculeus about one-half of abdomen. 36. *porrectorius*, 2¾—4 lines.

b. Tarsi not white-ringed; aculeus almost as long as the abdomen. 38. *rufiventris*, 3 lines.

C. Metathoracic spiracles elongated and large (males).

a. Apex of abdomen red, sometimes fuscous.

* Front coxæ dark. - - - - 21 *attentorius*, 4—6 lines.

** Front coxæ pale. - - - 25. *albatorius*, 4½—5½ lines.

b. Middle of abdomen red; hind tarsi white-ringed.

† Areolet pentagonal. - - - 32. *arrogans*, 4½—5 lines.

†† Areolet almost quadrate. - - - 42. *adustus*, 4 lines.

D. Metathoracic spiracles round, or nearly so, and small (males).

a. Abdomen red from the 2nd segment; hind tarsi white-ringed.

* Hind legs black. - - - - 40. *leucotarsus*, 3—4 lines.

** Hind femora red, base black. - - 34. *leucostictus*, 3½ lines.

b. Middle of abdomen red.

* Hind tarsi not white-ringed.

† Hind tibiæ red, apex black. - - - 35. *hostilis*, 3—3¾ lines.

†† Hind tibiæ black, base whitish. - - 41. *tibiator*, 3¾ lines.

††† Hind legs entirely black. - - - - 45. *nigripes*, 4 lines.

** Hind tarsi and antennæ white-ringed; margins of intermediate segments white. - - - 36. *porrectorius*, 3½—4½ lines.

SECTION 5.—Scutellum black; abdomen red and black, apex white.

A. Metathoracic spiracles large and elongate (male and female).
Abdomen red, apex black; legs black, front ones paler; antennæ of female white-ringed. - - 44. *nubeculatus*, 3½—5 lines.

B. Metathoracic spiracles round, or nearly so, and small (females).

a. Hind tarsi white-ringed.

* Antennæ not white-ringed. - - - - *antennatus*, 3½ lines.

** Antennæ white-ringed.

† Apical joint of hind tarsi as long as the 2nd, 3rd and 4th joints. 57. *elegans*, 5—6 lines.

†† Apical joint of hind tarsi not quite so long as the 3rd and 4th joints. *amænus*, about 4 lines.

b. Hind tarsi not white-ringed.

* Coxæ and trochanters black (var. of *migrator* and *cimbicis*, red).

† Hind tibiæ white at the base.

‡ Antennæ bicoloured.

§ Post-petiole subtransverse. - - 51. *migrator*, 3—4½ lines.

§§ Post-petiole elongate. - - - - *cimbicis*, 3—3½ lines.

‡‡ Antennæ tricoloured. - - - 54. *fumipennis*, 3—4 lines.

†† Hind tibiæ not white at the base; hind femora short and thick. 47. *peregrinator*, 2—4 lines.

** Coxæ red, middle and hind ones partly black at the base.
Head partly fulvous; ?spiracles circular. · 52. *ruficeps*, 4½ lines.

*** Coxæ and trochanters red.

× Hind tibiæ white at the base. - - 56. *incubitor*, 2½—3 lines.

× × Hind tibiæ not white at the base. · 57. *carnifex*, 5—6 lines.

C. Metathoracic spiracles small and round, or nearly so (males).

a. Antennæ white-ringed. - - - - *amænus*, 4½ lines.

b. Antennæ not white-ringed.

* Base of hind tibiæ white.

† Hind tarsi white-ringed.

‡ Orbits and bifid mark below antennæ white. · *cimbicis*, 3½ lines.

‡‡ Orbits only white.

++ The 5th segment the widest. - - 51. *migrator*, 3—4½ lines.
++++ The 2nd segment the widest. - - 54. *fumipennis*, 3—4 lines.
†† Hind tarsi not white-ringed. - - 56. *incubitor*, 2⅕—3 lines.
** Base of hind tibiæ not white.
§ Coxæ and trochanters red, hind tarsi white-ringed.
× Apical joint of hind tarsi about three times as long as wide.
57. *carnifex*, var., 4½—6 lines.
× × Apical joint of hind tarsi about four times as long as wide.
57. *elegans*, 6 lines.
§§ Coxæ and trochanters black.
o Middle and hind tarsi white-ringed. - 47. *peregrinator*, 2—4 lines.
oo Hind tarsi only white-ringed. - - - 48. *ornatus*, 5 lines.

SECTION 6.—Scutellum pale; abdomen red and black, apex white.

A. Metathoracic spiracles elongate and large (females).
a. Antennæ and hind tarsi white-ringed. - 43. *confector*, 4 lines.
b. Antennæ white-ringed, but not the hind tarsi; aculeus about one-half of abdomen.
* Hind femora red, apex black. - - - 42. *adustus*, 4 lines.
** Hind femora entirely black. - - - 45. *nigripes*, 4 lines.
B. Metathoracic spiracles small and round, or nearly so (females).
Antennæ white-ringed; aculeus about one-half of abdomen.
a. Coxæ red. - - - - - - 48. *tricolor*, 2½—3 lines.
b. Coxæ black. - - - - - - 49. *fugitivus*, 2⅓—3¼ lines.
C. Spiracles of metathorax large and elongate (males).
Femora and tibiæ red, apex of hinder black; internal orbits and ring of antennæ white. - - - 46. *tinctorius*, 3—4 lines.
D. Spiracles of metathorax small and circular (males).
a. Hind tibiæ white at the base.
* Hind tarsi white-ringed.
51. *migrator* var., *fumipennis* and *cimbicis* var. See section 5.
** Hind tarsi not white-ringed.
† Apex of 1st segment white. - - 55. *pygoleucus*, 2⅕—3 lines.
†† Apex of 1st segment not white. - 56. *incubitor?* 2⅕—3 lines.
b. Hind tibiæ not white at the base.
* Hind tarsi white-ringed.
† Middle tarsi white-ringed. - 47. *peregrinator* var., 2—4 lines.
†† Middle tarsi not white-ringed. - - - 49. *fugitivus*, 3 lines.
** Hind tarsi not white-ringed.
‡ 3rd segment red, with a black band. - 50. *subcinctus*, 3½ lines.
‡‡ 1st to 4th segments red. - - - - 48. *tricolor*, 2½—4 lines.

SUBDIVISION II.—Thorax more or less red.

A. Abdomen black, anus white; antennæ black; scutellum yellow (male and female). - - - - - - 59. *signatorius*, 2½ lines.
B. Abdomen yellowish red, petiole and from the 4th segment black; antennæ tricoloured (female). - 33. *minutorius*, 2½—3 lines.
C. Abdomen tricoloured.
a. Scutellum or post-scutellum more or less red (male and female).
57. *carnifex*, 4½—6 lines.
b. Scutellum white (female). - - - - 58. *rufoniger*, 2½ lines.

PLATYMETOPIUS UNDATUS, De Geer.

GENUS AND SPECIES OF HEMIPTERA-HOMOPTERA NEW TO THE BRITISH FAUNA.

By G. C. Bignell.

During the past summer I have had the pleasure of collecting in this neighbourhood with Mr. John Scott; one of our trips was a visit to Bickleigh Vale. In going there we passed through what is now a meadow, but I am sorry to say it was planted with young fir trees about two years since; fortunately the trees are at present very small, and I trust they may long remain so; but this cannot be expected; consequently in a few years the only meadow between Plymbridge and Cann Quarry will be a thing of the past. It is a lovely spot, of about three acres in extent, and situated in the heart of woodland scenery; it was in this spot *P. undatus* was taken. On our arrival there we each began to sweep and search for our respective favourites; after working some time I captured a very pretty Homopteron. On showing it to Mr. Scott he remarked, "I do not remember having taken that before." After some time I captured a second, and at the same time thought I must have taken it off a fern (*Pteris aquilina*), having just previously made a sweep for an ichneumon. I mentioned this to him, and he, taking the hint, devoted his attention exclusively to sweeping them, and was well rewarded.

This pretty insect is 6 mm. in length, and of a beautiful chocolate-brown and orange-yellow when fresh; these colours are much lighter in older specimens. I shall not attempt to minutely describe it. Mr. Scott, who has described so many before, no doubt will describe this in his favourite magazine. I may, however, say that when at rest, and viewed from above, the upper part of the head, thorax, and space been the two brace ⏞⏟ like markings on the elytra is chocolate-brown, the outer margins yellow; the legs and under side of the entire insect is a lemon-yellow.

During our walk back to Marsh-mill Railway Station, I suggested to him our next trip should be further up the vale, where the brackens are abundant, and nature permitted to have its own way, believing we might obtain a greater number, and probably another rarity; consequently on August 9th we visited Shaughbridge; but, after working some hours in the locality, did not capture a single specimen. On the 11th we again visited the first-named locality, and were rewarded with a very fair number, mostly females, in fine condition. We may, therefore, presume that the above dates would be the best time to collect any that may be required for the cabinet.

Stonehouse, Plymouth, November 16, 1882.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

NOTE ON CHELONIA CAJA.—While wandering about Epping Forest on the 25th of July, 1882, I picked up from a tuft of grass in a bare open spot, and put into a pill box, a female *Chelonia caja.* On reaching home (on the 29th) I found that it had laid a quantity of eggs (afterwards counted, to the number of 600) and died. The eggs were watched daily until the 26th of August, when, as if by magic, all suddenly hatched. The caterpillars were immediately fed upon lettuce leaves, and all throve and grew, changiug their skins once or twice within the following ten days or so. About that time a number of the caterpillars—about 200—began to grow much more rapidly than the rest, these latter, however, continuing perfectly healthy though increasing but little in size, being now about one-half to three-quarters of an inch in length. After about a fortnight more I separated all these sluggish growing larvæ, and subsequently, concluding that they would not now feed up to their full size before winter but would hybernate, I turned them out of doors to take their chance. The 200 thriving ones continued to feed voraciously, growing very rapidly until towards the end of September, when they began to spin up and assume the chrysalis state. Just at that time, very unfortunately, the lettuce plants, from which they had been hitherto fed, failed, and leaves from a fresh and more luxuriant batch of plants were given to them. The effect of (I suppose) the too luxuriant growth of these fresh leaves was to disease and kill the larger number. About 30, or 40, however escaped and became chrysalids, ten having become perfect insects within the last fortnight. All these imagos are almost exactly like their parent, of a rather pale type, but offering scarcely any variety in their markings; the rest will doubtless emerge very shortly; three, in fact, have appeared to-day. My object in noting the above is to record an instance of a fact new to me (though perhaps familiar to others), that out of a single batch of eggs laid by one female there should be a portion (about one-third) destined, evidently by something in their own nature and vital force (quite independent of all surrounding circumstances), to develope thus rapidly to the perfect form, while the rest, under precisely similar treatment, made the slowest possible progress, through retaining every appearance of health and vigour, evidently intending to pass the winter and feed up in the following spring or early summer, not to appear probably in the perfect state until June or July, 1883. The time from the deposition of the eggs to the appearance of the first moth was seven weeks.—O. P. Cambridge; Bloxworth, November 1, 1882.

Cidaria russata and C. immanata.—With reference to the remarks made by me on page 253 of the 'Entomologist' for the present year, that the *Cidaria immanata* taken in the Island of Arran, could, at a little distance, be scarcely distinguished from the *Cidaria russata* of the Outer Hebrides, I have since had the advantage of critically examining a large series of the insect from Arran, with Mr. Howard Vaughan, whose special knowledge of the two species is much greater than my own; we have arrived at the conclusion that the *Cidaria* taken in Arran is specifically identical with the Hebridean local variety, and that both are undoubtedly *Cidaria russata*. *Cidaria immanata* has been taken in Arran by Mr. Howard Vaughan, so that all that is necessary is to add the name of *Cidaria russata* to the list of Macro-Lepidoptera taken in Arran. *Phasiane palumbaria* should also be added to the list of the insects captured there. It is a remarkable fact that these two species, *Eubolia* and *Cidaria*, should be so closely alike that an experienced collector, as Mr. M'Arthur undoubtedly is, should have been mistaken in the species, particularly as he had also captured in some numbers *Cidaria immanata* in Shetland. I have in my own cabinet a specimen of *Cidaria russata* from Arran, singularly like some of the varieties of the polymorphic species *Cidaria immanata*; indeed I confess I thought it was of that species.—J. Jenner Weir; 6, Haddo Villas, Blackheath, S.E., November. 1882.

Notes on hypsipetes elutata and Cidaria russata.—Mr. Jenner Weir, in his paper on 'The Macro-Lepidoptera of the Isle of Arran,' at Entom. xv. 253, suggests that the larvæ of the small dark form of *H. elutata* feed on heath (I suppose ling, *Calluna*, is meant, and not heath, *Erica*?). I believe that bilberry is more likely to be the food-plant; at any rate such is the case with us. Both forms of the species occur here in profusion; larvæ from woods, hedges, &c., of sallow, willow and other trees producing generally the large, greenish, striped form; and the moorlands, and especially woods having a thick undergrowth of bilberry, producing the small and nearly black, in many specimens indeed quite black, form. There is usually plenty of ling growing with the bilberry, but I am not aware that *elutata* ever feeds on it, though being such a general feeder it may to some extent do so. But the bilberry plants are always infested with its larvæ. In similar woods too, we get, along with the ordinary type, a very dark form of *Cidaria russata*, having a black central band on a very dark reddish brown ground, and without any trace of the usual slaty-gray. I have sometimes thought these were produced either from the bilberry or ling, as I do not remember noticing this particular form where those plants did not grow.—Geo. T. Porritt; Huddersfield, November 1, 1882.

Life History of Emmelesia tæniata.—I have at last had the satisfaction of breeding this handsome and most-difficult-to-get insect from a dozen eggs which a female laid on the 20th of July last year. They hatched during the second week in August; then I had to face the food difficulty, having for years tried to rear this species and only once got one larva to feed up. I then had tried every leaf, seed, and flower that grew near where the moth occurred; but all to no purpose, until accident assisted me so far then to that which has now led to success. I had picked up some moss thinking it would be suitable for any larva to change in. I was struck by seeing this particular moss having leaves on the stem like a fern; I put it under my glass; I saw some of the tip end of the leaves yellow and slightly eaten; I then found a young larva, the one noted above; I thought—so far so good, another year I will try again; I placed the eggs all on a nice bed of the *Brium*. The larva kept slowly growing, feeding on the dead leaves. When the moss began to flower they ate very little of it. In October the larvæ—some were half-grown and others very small—laid up, and there they remained doubled up on the stems until the middle of April; at that time the moss was in fine seed. The warmth of the greenhouse made them stir, and I was delighted to see the seed-vessels well cleaned out, and thought now there was hope, when I saw three fine healthy larvæ at the top of the plants. About the middle of May they disappeared; I became anxious as to their fate, thinking a great wire-worm that I found among the roots had eaten them. However, on my return home on the 12th June there was what should have been a fine female, as bad as any captured one, but having reared it was all I cared for. I made three drawings of the larva, and now give a plain description from sketches made, but I think with looking at them so much I could remember every mark on them. The larva when full grown is short, about five-eighths of an inch long, very slightly attenuated, has a very peculiar habit when at rest; it looks like a pot-hook. The ground colour of a full-grown larva is of a yellowish brown, with five clear black spots; on the sixth segment a still smaller spot, which are all of a wedge-shape. Between these spots are diamond-shaped spots of a dark brown colour, which give it the appearance of a *Eupithecia* larva. On the sides are two very narrow pale lines; beneath these the colour is of a pale ashy hue; the head and legs are of same tint. The head and body are clothed with hairs,—or spines I may call them, they are so long for a small larva. Above the anal segment, for a full eighth of an inch, it is nicely marked with dark and light brown, which looks like fine net-work. The larva curls up at once whenever it is even looked at. I generally had a peep in the evening, for during the day they were often not to be seen, having gone beneath the moss. Under all circumstances they must be difficult to breed.—J. B. HODGKINSON; Spring Bank, Preston, October 1882.

SERROPALPUS STRIATUS.—In September 1881, I took, I believe at Newmarket, a beetle which turned out to be *Serropalpus striatus*, a continental Melandryid. I should be glad to know whether any other specimens have been met with.—E. BLUNDELL; Moulton Lodge, Luton, Oct. 11, 1882.

[*S. striatus*, Hellenius, is included in Sharp's 'Catalogue' and Pascoe's 'List.' See Ent. Ann., 1872, pp. 76–8.—E. A. F.]

RANATRA LINEARIS, *Linn.*, NEAR HASTINGS.—The Rev. W. W. Fowler speaks of *Ranatra* as occurring near London and Deal (Entom. xv. 230). In 1879 and 1880 this insect was extremely abundant in ponds at Bopeep and Guestling, and also near the town reservoirs. For the last two years, however, I have searched in vain in the same places. At Reigate I took two or three specimens in a pond in the Castle Fields in April, 1879. *Naucoris cimicoides*, Linn., used to swarm in this same pond.—E. P. Collett; St. Leonard's-on-Sea, October 10, 1882.

Hoplisus bicinctus, *Rossi*.—On the 1st August last, between Bickleigh Bridge and the railway station, I had the pleasure of taking two females of this rare wasp. It differs, however, from Mr. Smith's description in having the fuscous portion of the flagellum extended to and beyond the last apical joint; in having on the scutellum a yellow line, instead of two spots; on the 1st segment of the abdomen two egg-shaped spots broadly united, and covering the upper surface and nearly the whole of the sides (in fact it would be better described as a band), instead of two triangular spots; the broad yellow band on the 2nd segment is continued across the venter; the narrower band on the 3rd is not continued across the venter, but is represented by a dot on each side and two in the centre, in one specimen; in the other the central dots are wanting. Mr. E. Saunders describes this insect with two spots on the 1st segment, and length 11 mm.; these specimens are respectively 9 and 9½ mm.—G. C. Bignell.

Entomology of Australia.—I may premise by stating that I am an amateur entomologist, living in the Bush on a cattle-station some 80 miles south-west of Rockhampton, and being desirous of extending my collection of insects, and moreover encouraged by that felicitous motto on your 'Entomologist,' I take the liberty of asking if you would kindly introduce me to some of your entomological acquaintances who perhaps would be glad to make exchanges, either for the Coleoptera or Lepidoptera of Australia. My desiderata are foreign Lepidoptera or Coleoptera, not European. I could obtain Flies, Hornets, &c., or Bugs, should they be desiderata. I trust you may meet with some who would be inclined to correspond.—Geo. Barnard; Coomooboolaroo, Duaringa, *via* Rockhampton, Queensland.

OBITUARY.

William Hey.—The Venerable Archdeacon Hey, born at Ockbrook, in Derbyshire, of which place his father was Vicar for over forty years, died at the Canon's residence within the Cathedral precincts, at York, suddenly, of heart disease, November 22nd, 1882, in his 72nd year. To those who, like the writer of this notice, knew the Rev. Canon Hey at the time when he most assiduously worked the Coleoptera of York district, the announcement of his death comes almost as a personal loss, and a reminder that one may outlive one's earliest friends. Although not an obtrusive writer upon that branch of Entomology, Coleoptera, which was his particular forte, few men knew the great division Hydrodephega so well as he. His careful examination of the aquatic life of the ponds adjoining the well-known boggy ground near Askham resulted in the addition of, we believe, more than one species to the British fauna, and many species, which were almost unknown in the collections of the time, found numerous representatives through the kindness of this amiable collector. In his earlier life, while at Cambridge, he devoted much attention to the Lepidoptera of the district, and used, years afterwards, to point out with pride specimens of *Polyommatus Hippothoe* in his collection as his own capture. Although a man whose time was very fully occupied by constantly increasing Church work—amongst other important appointments he was Archdeacon of Cleveland, Canon Residentiary and Precentor of York, Rural Dean, Vicar of St. Olives, York, and Examining Chaplain to the Archbishop of York—the venerable Archdeacon ever found opportunity to entertain even the most humble worker in his favourite study, and to afford the student such assistance as he might, with such felicity as to send away the young entomologist feeling that in addition to obtaining knowledge he had also made a friend. In the local scientific world he was associated with the Yorkshire Philosophical Society, to the council of which he was elected in 1841, and of which, at the time of his death, he was one of the honorary curators, taking the meteorological department of the Museum, and sole curator of the insects and Crustacea; being likewise a vice-president of the Society. Archdeacon Hey was one of the early members of the British Association, and will be well recollected by those who attended the Jubilee of that Society, held last year in York, for the great personal interest which he took in its business on that occasion. We may conclude by observing that this is another instance of hereditary scientific taste, his grandfather, William Hey, F.R.S., of Leeds, being one of the shining-lights of his day in philosophy and science. We understand the Rev. W. C. Hey, son of the late Archdeacon, inherits his father's taste as a Coleopterist.—J. T. C.

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